

The Iron Age

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A Review of the Hardware, Iron and Metal Trades.

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Published every Thursday Morning by DAVID WILLIAMS, Nos. 66 and 68 Duane Street, New York. Entered at the Post Office, New York, as Second-Class Matter.

Vol. XXXIX: No. 9

New York, Thursday, March 3, 1887.

\$4.50 a Year, Including Postage.
Single Copies, Ten Cents.

The Springfield Traction Engine.

We take pleasure in presenting on this page and also on page 17, engravings of a traction engine built by the Springfield Engine and Thresher Company, of Springfield, Ohio. One of the main features of the engine is found in the driving axle, shown in Fig. 2. The gearing is there represented in combination with a spur-wheel L and countershaft N, representing the outlines of the boiler. The traction wheels are taken off the axle to show the gearing and clutches more distinctly. The compensating gear consists of two bevel-wheels, G and K, and three bevel pinions, H. The bevel-wheel G is keyed rigidly to the axle C. The bevel-wheel K drives the left-hand traction-wheel, which turns loosely on the axle C. The clutch M is also keyed rigidly to the axle C. The square steel pins A (which are shown by the dotted lines) are even with the inside of the flange of the bevel-wheel K, but on stony or slippery

on this circular plate I and the center frame F, and if the springs were removed would turn loosely on said plate and frame. There are six springs inside the spur-wheel D connecting the spur-wheel with the center frame F. Three of these springs are compressed when the wheels are

A pinion which is on the end of the engine shaft drives the spur-wheel on the counter-shaft. On the opposite end of this counter-shaft is the pinion L. This pinion L drives the wheel D, which is connected by springs to the center frame F. This frame is driven by springs through the wheel

is slid in from one end of the axle and the cast-iron end piece K is slid in from the other end of the axle and are joined and bolted together as shown in cut. These castings J and K have lugs on each side. On the front side the lugs are to receive the tongue in case the engine

going over obstructions or uneven ground. The cylinder casting E is bolted to the boiler, and has two square lugs M cast on the opposite sides of the inside. These lugs M fit in recesses cast in the ball and socket D to slide up or down as the movement of the springs may be, and at the same time keep the ball and socket D from turning, so that there is no strain put on the spring but a central compression. The screw G is loosened when the engine is on the road, but when the engine is set for threshing or to furnish power to run machinery this screw G is screwed up and takes the weight of the boiler off the spring A. There is an opening between the box J and the ball and socket-piece C to receive the "push and pull" rod I. One end of this pull rod I receives the king-bolt B, and the other end receives a casting, P. This casting fits loosely around the rod I on one end, and on the other fits loosely over a wrought-iron brace, Q, and is connected with it by a pin, T. The wrought-iron brace Q is bolted on each end

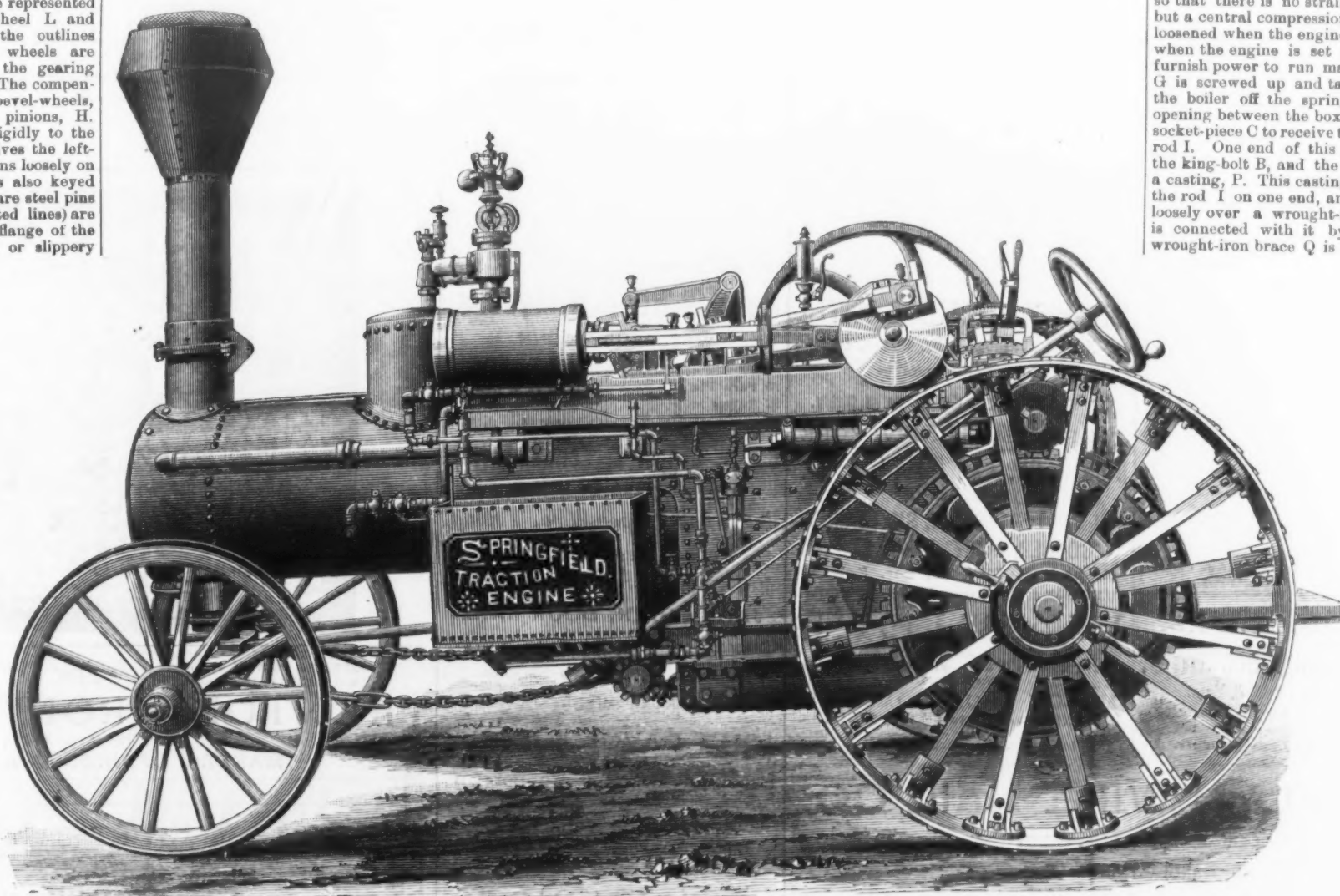


Fig. 1.—General View.

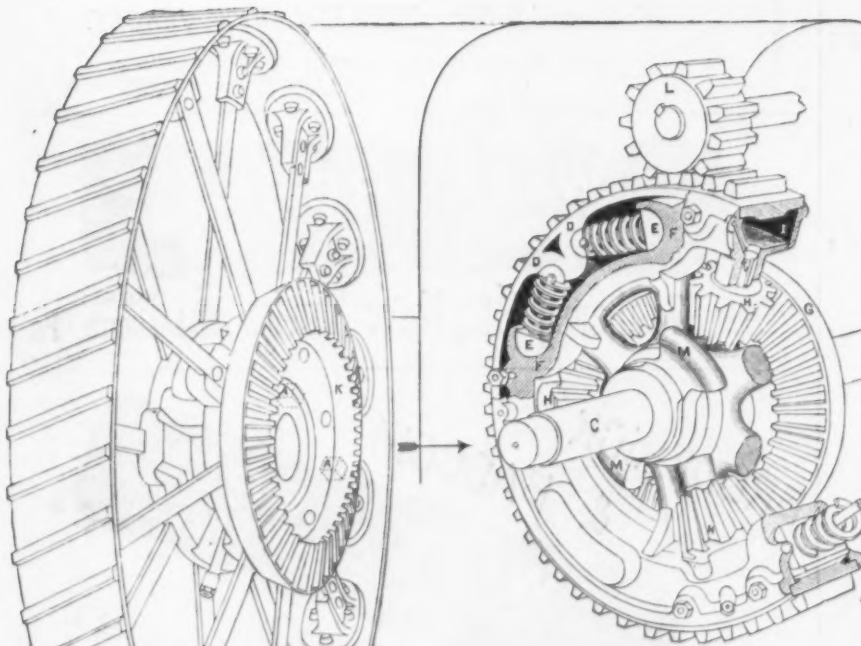


Fig. 2.—Gearing of Driving Axle.

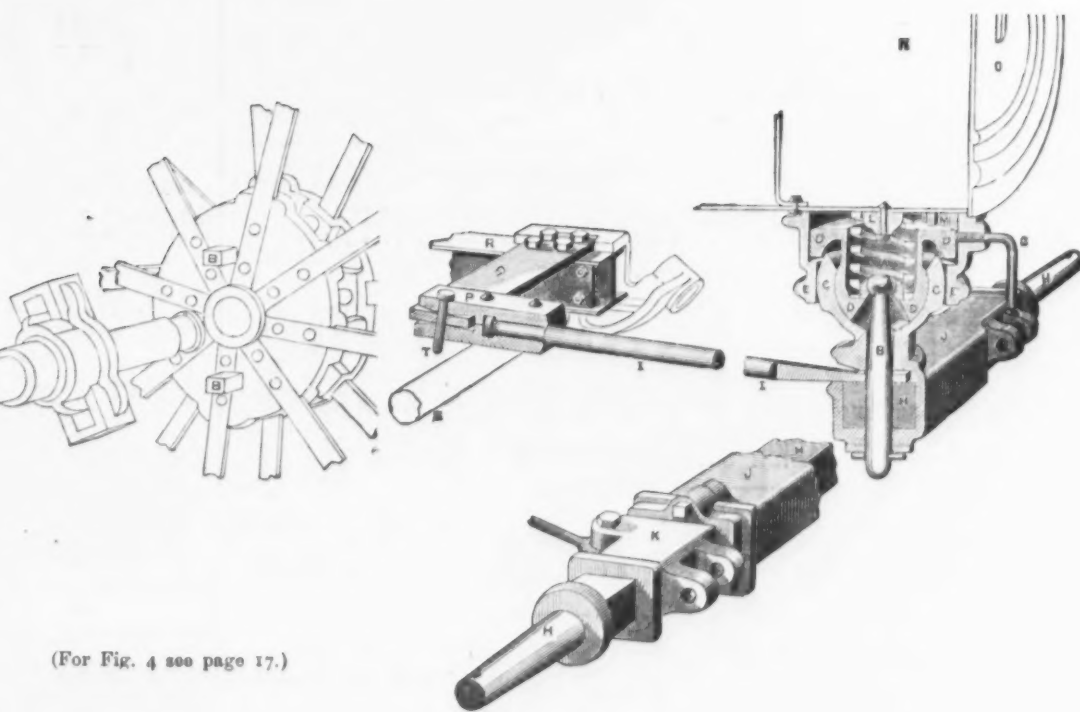


Fig. 3.—Details of Front Axle.

TRACTION ENGINE, BUILT BY THE SPRINGFIELD ENGINE AND THRESHER COMPANY, SPRINGFIELD, OHIO.

roads, where it is necessary to have both wheels rigid, these pins are connected with the clutch M, by moving in as far as shown by the dotted lines by means of a half turn of the worm plate, which is shown on the outside of the traction-wheel in Fig. 1. The three bevel pinions H have each a journal, J, at each end, which is allowed to turn loosely in the babbitted boxes of the center frame F. This center frame F is, as partly shown in section, between the two bevel wheels G and K, and has an eye in its center, which is allowed to turn loosely partly on the hub of the bevel-wheel G and the other part on the hub of the clutch M. A circular plate, I, is held in a central position by shoulders on the center frame F, and is bolted to the same. The spur-wheel D rests

driven forward, and the other three springs are compressed when the wheels are driven backward. These springs make an elastic connection between the spur-wheel D and the center frame F, and have a circular trunnion, E, on which it turns loosely in the journals of the center frame F and the spur-wheel D, making the compression of the springs always central. The right hand traction-wheel is also loose on the axle C, and is driven by two steel pins B. The two pins B are driven from a clutch which is keyed rigidly to the axle C. When the engine is to be pulled by horses, these two pins are withdrawn from the clutch by means of handles on the outside of the traction-wheel. This enables the horses to pull the engine with ease.

D and carries the three bevel pinions H. These three pinions mesh on one side with the bevel-wheel K. The bevel-wheel G being rigid on the axle, drives the right-hand traction-wheel and the bevel-wheel K drives the left-hand traction-wheel. In running the engine in a straight line, the bevel pinions H act as simple drivers on the bevel-wheels G and K, but being connected loosely, they enable the engineer to turn the engine at any desired angle by means of the steering attachment.

Fig. 3 represents the front axle in connection with the frame work R; N represents the boiler; O the smoke-box door. The axle H is a solid wrought-iron forging with a hole in the center for the king bolt B. The axle collars are removed and a cast-iron box, J,

should be drawn by horses, and on the other side the lugs receive the ends of the chains which connect the front axle to the steering chain shaft S. The cast-iron box J also has a ball and socket-piece, C, on the upper side. This ball and socket-piece C receives another ball and socket D which carries the spring A. On the inside, this spring A rests with one end on the ball and socket D, and on the other carries the boiler N. A little casting, L, which is riveted to the boiler, keeps the spring A in a central position all the time. This ball and socket joint enables the axle H to turn around the center of the king bolt B far enough to allow the engine to turn in a small space. It also allows either of the front wheels to be raised or lowered 20 inches in

to the main frames R. The steering-chain shaft S is in a journal on one end, which is bolted to the right-hand main frame and the other end goes through a journal on the left-hand main frame R. On this the worm wheel is keyed and is geared to the worm on the hand-wheel shaft, as shown in Fig. 1. It will be noticed that the total strain produced by the pushing and pulling of the front axle is nearly all on the main frames R. There is but very little strain on the boiler through the cylindrical piece E, which has nothing to do but to steady the top piece C and to hold the hand screw A in its place.

No matter in what position the front

(Concluded on page 17.)

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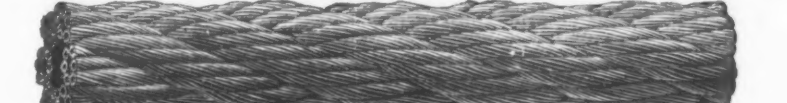
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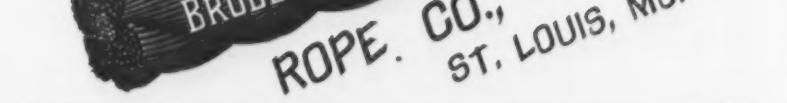
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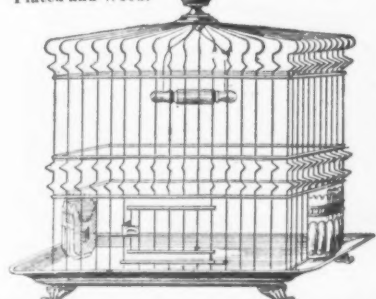
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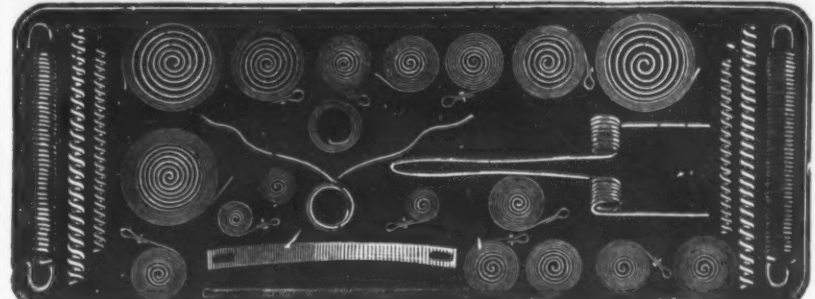
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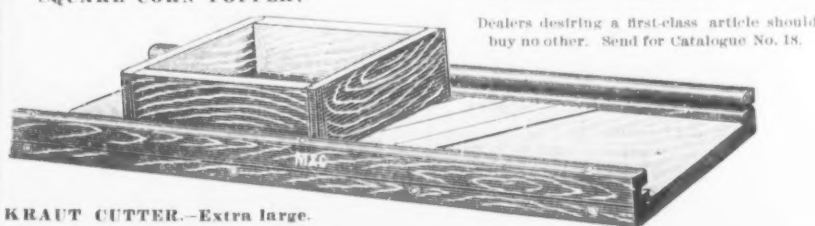
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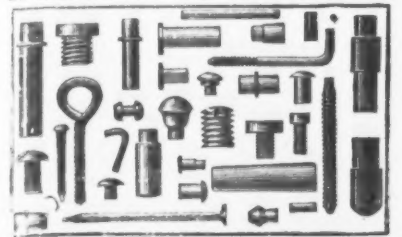
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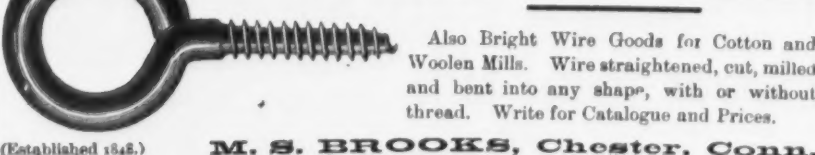
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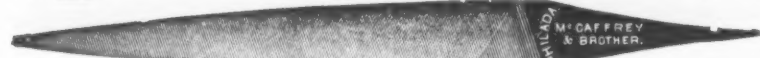
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This Knife is the **BEST IN USE** for cutting down hay and straw in mow and stack cutting fine feed from bales, cutting corn stalks for feed, cutting peat & ditching marshes. The blade is **Best Cast Steel**, spring temper, easily sharpened, and is giving universal satisfaction. A few moments' trial will show its merits, and parties once using it are unwilling to do without it. Its sales are fast increasing for export as well as home trade, and it seems destined to take the place of all other Hay Knives. They are nicely packed in boxes, 1 dozen each of 60 pounds weight, suitable for shipping by land or water to any part of the world.

Manufactured only by
HIRAM HOLT & CO. EAST WILTON, Franklin Co., MAINE.
For sale by the Hardware trade generally.

CAUTION.

We are informed that various parties are infringing upon the widely-known Letters Patent granted originally to GEORGE F. WEYMOUTH for an improved Hay Knife. The invention patented to GEORGE F. WEYMOUTH is embodied in a sword-shaped blade provided with operating handles for working the same, the edge of the sword-blade being furnished with knife-edged serrations or teeth. **IT IS OUR PURPOSE TO PROSECUTE ALL INFRINGEMENTS,** and to hold every party liable to the full extent of our ability and of the law all parties who manufacture any knife infringing upon the patent, or who deal in the same. Several suits are now pending in the U. S. Courts. **IT IS ALL MANUFACTURERS AND DEALERS ARE HEREBY WARNED OF OUR RIGHTS, AND THE PUBLIC ARE CAUTIONED AGAINST PURCHASING ANY HAY KNIVES, MADE AS DESCRIBED ABOVE, WHICH ARE NOT OF OUR GENUINE MANUFACTURE.**
EAST WILTON, Sept. 1, 1886.



W.H. CARTER'S PATENT NEEDLE HAY KNIFE.

PAT. APR. 29, 1884.
IMPROVED BY H.M. BARTLETT.
Improvement Patented April 28, 1885.

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NEEDLE HAY KNIFE,

THE BEST IN THE WORLD.

Improvement patented April 28, 1885, of which we are the sole manufacturers, has been tested with the most celebrated knives of other makers, and has proved an easier and faster cutter than any other. Its special excellence consists in the chisel-edge tooth shown in the engraving. It may be used for cutting hay in the mow, stack and bale; also for ditching, cutting peat, or any other work for which a hay knife is used. It can be readily ground by the most inexperienced, as it requires to be ground only on one side. Should a tooth break, all that is necessary to replace the damage is to grind it once and a new chisel-tooth appears. It can ordinarily be sharpened with a common scythe stone. Try one and you will give it the preference.

TOWER & LAMONT,

MANUFACTURERS OF

RAZOR STROPS, Rochester, N. Y.

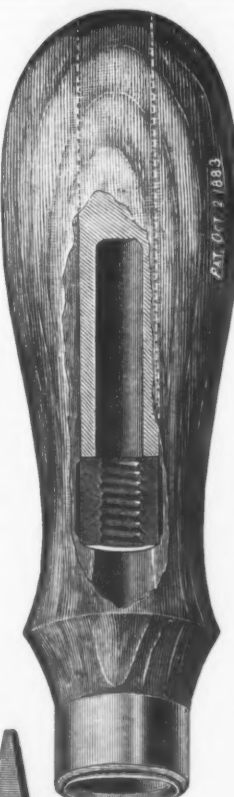
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The LAMONT is the original Combination Strop and the Standard. It positively has no equal. If your jobber does not have it, send to us. Belt of Russia leather.

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Regular and Chisel Pointed; Black and Galvanized.
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As a guarantee of the superior quality of Screw Tang Files over all others for any that are unsatisfactory as to temper, &c., we will give in exchange two for each one that is returned to us. One Handle will last a lifetime in constant use, making it the cheapest Handle in the World. Cost 10 cents each.

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Warranted Cast Steel.

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Specially Adapted for Use on Wire Fence.

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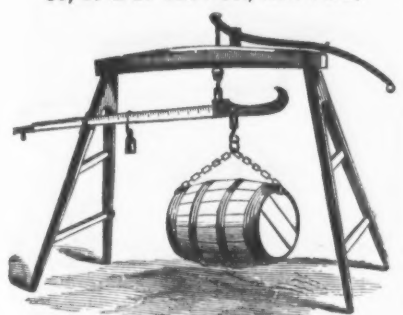
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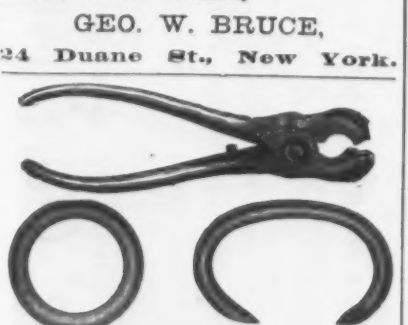
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Will close Ring outside nose if so desired. Millions in use. Ring production daily, 80,000.
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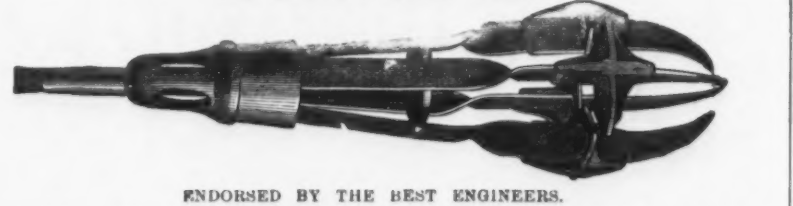
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Stanley's Universal Hand Bader.
For Beading, Reeding or Fluting, and for all kinds of light Routering, this tool is invaluable to wood-workers. Seven superior steel cutters go with each tool. Both ends are sharpened, thus embracing six ordinary sizes of Beads, four sets of Beads, two Fluters, and a double Router (3/4 and 1/2 inch). The cutter is firmly clamped to the stock. A gauge with long, straight bearing surfaces is used in ordinary work, and a gauge with oval bearing surfaces is used for curved or irregular forms of work. No. 66. Iron Stock, with seven Steel Cutters. \$1.00

THE NATIONAL STEEL TUBE CLEANER,
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THE ORIGINAL
**SOLID VULCANITE
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Runs Easy and Safe,
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Is More Durable — Hence Cheaper.
A trial will convince you of this.

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Duplex Reversible Screw Driver.
TWO SIZES IN ONE, AND AT THE PRICE OF ONE.
PATENTED.
BEST CAST STEEL WARRANTED.
Send for Descriptive Circular and Price List.
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Recent Treasury Decisions.

Certain car-wheel centers, consisting of forgings of iron which have been advanced by other processes of manufacture—being bored out for the fitting of the axle, the hubs faced, and the rims turned and finished with a flange of steel bolted thereon to prevent the tires from slipping, but which are not tired—are held to be dutiable at the rate of 45 per cent. ad valorem, for "manufactures composed wholly or in part of iron * * * or any other metal, and whether partly or wholly manufactured."

Certain plates of cast iron which, when put together, constituted an ice machine, notwithstanding the fact that some of the parts had undergone a process of boring, polishing and finishing, to render them fit for use as such machine, have been held by the courts in two different suits—one at Chicago and the other at St. Louis—to be "castings of iron," and, as such, to be dutiable at the rate of 1 1/2 cents per pound, and the department, by the advice of the United States Attorney General, has acquiesced in such decision.

On the exportation of tacks and shoe nails manufactured from imported bar steel a drawback will be allowed equal in amount to the duty paid on the imported material used in the manufacture, less the legal retention of 10 per cent.

Certain articles, consisting of a stereotype press, a stabbing machine and a card-board knife, although imported for the use of a college, are not entitled to free entry, inasmuch as, being part of the outfit of a printing office, they do not come within the scope of the provision in the free list, whereby certain specified articles specially imported for the use of certain institutions are exempt from duty.

"Tungsten metal," which is a substance in the nature of an alloy obtained from wolframite ore, which contains principally the metal, tungsten, and several other metals in various small proportions, and which is imported and used for the purpose of being added in small quantities to steel or iron in order to render the latter metals suitable for the manufacture of tools, is not one of the substitutes for steel contemplated by the provision in schedule, but is dutiable at the rate of 20 per cent. ad valorem, as an unwrought metal not otherwise provided for.

The Julien Electric Street Car.

At the present time, says the *Stevens Indicator*, few subjects are of more absorbing interest generally than the electric transmission of energy and its application to the driving of machinery, lighting, and to all other purposes where a convenient source of power is desirable. In the matter of traction on street car and elevated railway lines it is natural that electric motors should have received attention at an early stage of development in applied electricity, and the history of what has been accomplished in that field is therefore not without interest.

As the result of more recent investigation the Julien Electric Company, of New York, have brought out an electric street car, designed by Mr. Edmund Julien, with which during the past few months experiments have been made on the line of the New York Eighth Avenue Road. We will say at the outset that Mr. Julien's design embraces the adoption of electric accumulators, which he has made a subject of careful study, and from which, accordingly, he claims to be able to obtain results much superior to those with which we have all become more or less familiar. Mr. Julien, we are told, has succeeded in removing the old objections to the storage battery, and in his improved form of accumulator the plates remain rigid and suffer no distortion. The active material adheres perfectly to the metal plate, due principally to the nature of the alloy employed, and the life of the plates, as demonstrated by several instances, is a long one. After nearly two years' use they are said to have shown no change of form.

The car is of the ordinary street-car pattern, capable of carrying from 70 to 80 passengers, and was built by John Stephenson for the Vienna exposition in 1873. The accumulators are placed under the seats, and to facilitate their being handled, the lower panels of the car are made to open. The introduction and removal of the batteries, coupling, examination and all work connected with them can therefore be accomplished from the outside with the greatest ease. The motor and running-gear are placed beneath the car-floor. Under each platform is placed a commutator worked by a hand-lever. These commutators merit special attention. The regulating levers control toothed sectors, each tooth corresponding to a particular grouping of the batteries, and the discharge of each series is effected uniformly at whatever notch the commutator may be set. All the cells can therefore be recharged together. Without this provision the charging of a large number of batteries would be a matter of enormous complication in a regular service. It may be interesting to add that the car is lighted by two incandescent lamps fed by the batteries. The cranks worked by hand. The receiving bench for the accumulators at the terminal station is of the same height as the floor of the car, and it is thus an easy matter to slip the cases containing the batteries underneath the seats. The rate of speed is controlled both by the number of elements and by manipulation of the mechanism. It is noteworthy that Mr. Julien depends in no way upon artificial resistances. The rapidity of movement is controlled by the batteries, and full-speed, half-speed, full-stop and reverse motion are all obtained by the merest turn of the levers. To the commutators are brought the connections of all the sections of the batteries. All the mechanism has been devised so as to be easily operated by men who have had neither electrical nor mechanical training, thus ensuring the employment of men accustomed to the road and to street-car work generally. The motor is a Siemens dynamo, running at about 1000 revolutions per minute, and is belted to an intermediate shaft from which motion is transmitted to the driving axles by a phosphor-bronze chain belt. A matter of special interest is found in

the claim which is made for the commercial efficiency of the accumulators. This is placed as high as 80 per cent., a figure which has never before been reached in practice, and may even in this case be considered somewhat doubtful. At the Antwerp International Exposition, in 1885, the Julien car was exhibited in practical working with eminently satisfactory results. We have before us the report of the international jury which were appointed at that time to examine into the working of several traction systems, and from it find that that of Mr. Julien was awarded the diploma of honor both on the ground of efficiency and of economy. Experiments in New York are still being continued with Mr. Julien's devices, and the Julien Electric Company promise interesting developments at no distant date.

The Detroit Bridge.

The project for a winter bridge across the Detroit River has taken definite form. The first stages of the work have been begun. Mr. J. D. Hawks, the Chief Engineer of the Michigan Central Railroad, has drawn plans and is figuring upon an estimate of the cost; Mr. Henry Russell, general attorney of the company, who has been in Washington to bring the matter to the attention of Congress, has now returned. The matter was favorably received by the Treasury Department, the officials saying that with their present information they could find no objection to a winter bridge. It was suggested by the department that there might be objection to allowing a single railroad company to construct a bridge for its own use exclusively, but that a bridge company that would admit all trains of all railroads upon an equal basis of charges might be given the preference. The Michigan Central people said they did not object to that. The Dominion Government, it is understood, have granted authority to bridge the waters of the Detroit River in their jurisdiction. An act of Congress is necessary to complete this authority. Being designed for use only during the winter or the closed season of navigation, the railroad people do not anticipate that there will be any opposition to the bridge. The bridge as planned by Chief Engineer Hawks is to be 2600 feet in length. There are two draws, one 200 feet from the Michigan shore, the other 300 feet from the Canada shore. The draws with spans of 400 feet will give clear waterways of 175 each, or a total of 700 feet. The central span of 400 feet is to be removable, and when taken ashore during the season of navigation and the draws open, there will be five clear passageways for vessels, with an aggregate opening of 1100 feet. All the other spans, except the central one, which is 400 feet, and the one next the Michigan shore, which is 200 feet, are 300 feet long. There are four such spans.

The bridge will be low, not more than 25 feet above the surface of the river. Nine piers of masonry to sustain the spans, and two heavier piers for the pivots of the draws, will be built up from bed-rock at the bottom. The river bed has been surveyed and the formation is known. The water in the deepest part is 40 feet, and will average perhaps 25 feet from shore to shore. There is at the bottom silt and mud of varying depth, in midstream 40 feet, and nowhere less than 15 feet. Then comes hard clay of an average depth of 20 feet—except near the Michigan side, where the depth is 40 or 50 feet. Below that there is about 20 feet of hard pan for a distance of 700 feet from the Canadian shore. The hard pan ceases in the middle of the river, but reappears again 900 feet from the Michigan side, where it is about 15 feet deep. Below the hard pan is the bed-rock which will be the foundation of the piers. The total height of the piers will be 120 feet or thereabouts. The bridge will be wide enough for a double track. It will be of the iron truss pattern, and is expected to cost less than \$1,500,000, including all the approaches.

Utilizing the Water from the Severn Tunnel.—According to the *London Times*, an effort at length is being made to utilize the 14,000,000 gallons of water per day which the Great Western Railway Company are pumping at the Sudbrook Springs, on the Monmouthshire side of the Severn Tunnel, and at present allowing to run to waste, while it costs them nearly a year to pump it into the Severn estuary. The water has been submitted to analysis, and has been declared to be the purest spring water, entirely free from organic matter, and the finest water that could be desired for domestic purposes. The mayor of Bristol presided over a town meeting in favor of a scheme for using this spring as a further water supply for Bristol, by bringing it across the Severn by a tunnel beneath the bed of the river. It was stated that the company formed for this purpose consisted of influential Bristol citizens, and as a desire had been expressed that the corporation should have the control of the water supply of the city, the bill which had been drafted contained a clause enabling the corporation to exercise all the powers of the act on payment of the cost and expense incident to obtaining it, and sums expended by the company in exercise of its powers, with 5 per cent interest.

Cooper & Hewitts recently opened the Bedell Iron Mine, on the northern border of New Jersey. The mine, which is situated in the township of Sparta, is now worked under difficulties, as the ore has to be hauled a long distance by wagon to the nearest railroad station on its way to the Pequest Furnace, near Belvidere. The proprietors have already begun, however, the building of a branch railroad 4 miles long, connecting the mine with the Lehigh and Hudson River road and the Sussex branch of the Delaware, Lackawanna and Western road at Andover Station. When the branch is completed, operations at the mine will be extended on a large and important scale.

The Duluth Board of Trade has issued an interesting volume descriptive of the business of the Zenith City and its facilities.



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NEW REVERSIBLE GUARD RAZOR
MADE BY THE J. R. TORREY RAZOR CO., Worcester, Mass.
his Razor is used in the ordinary manner, with or without the guard. When used with the guard it is impossible to cut the face in shaving.
It is the only Practical Safety Razor made.
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GENERAL HARDWARE.

DAME, STODDARD & KENDALL,

IMPORTERS, MANUFACTURERS' AGENTS AND DEALERS IN

FINE FISHING TACKLE

OF EVERY DESCRIPTION.

SELLING AGENTS FOR

Skinner's Celebrated Fluted Trolling Spoon Baits.

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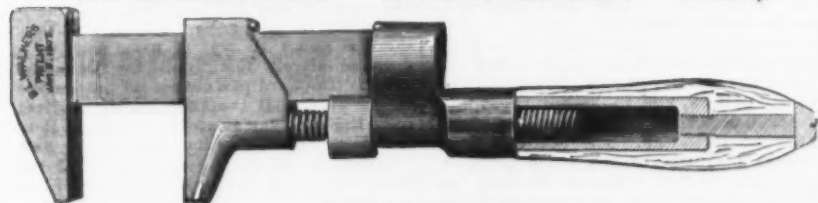
Manufacturers of Lancewood, Greenheart and
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MANUFACTURERS OF

WALKER'S PATENT STANDARD WRENCHES,

Pipe Attachments, Pipe Cutters, Stocks and Dies and Ratchet Drills,
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These Wrenches are more uniformly in proportion for excessive strain and have a larger opening than any other. The cross strain is very light; the tension or pull comes directly in line with the bearing. The offset in the handle gives additional leverage and does away with the danger attending a top pull with other Wrenches now in use.

All Wrought Bars, Thoroughly Case-Hardened, and every Tool Warranted.

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WIRE NAILS

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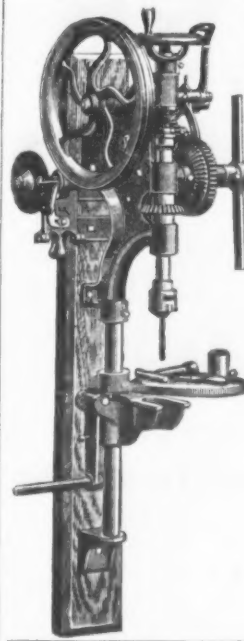
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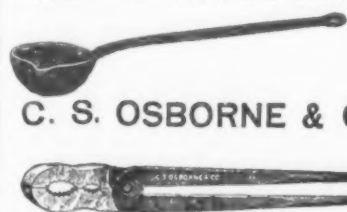
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Manufacturers of
BLACKSMITHS' UPRIGHT SELF-FEEDING DRILLS
HAND OR POWER.
Patented March 20, 1883, Dec. 23, 1883 and June 16, 1884.
Superior design. Durable Workmanship. Latest improvements.
Send for Illustrated Price List.

ESTABLISHED 1826.



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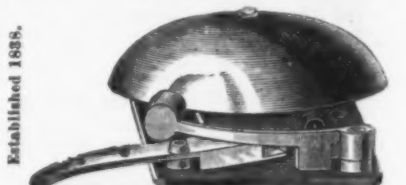
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UFACTURERS' TOOLS. Send for Price List. Ask your deal-
er for our make and take no other.

"HOW TO KEEP BOILERS CLEAN"

and prevent SCALING, FOAMING, BURNING. Price \$75.00. Removes Lime Oil, Magnesia, without use of Compounds.



Hotchkiss Mechanical Boiler Cleaner,
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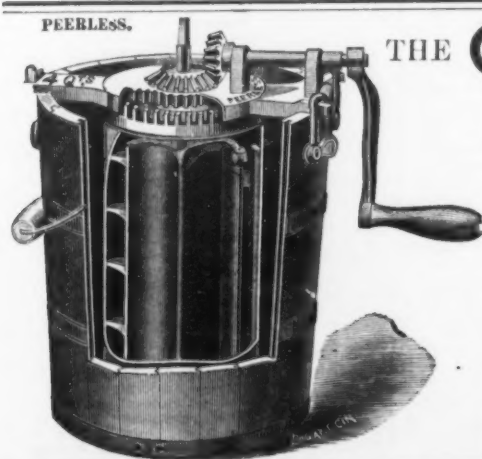
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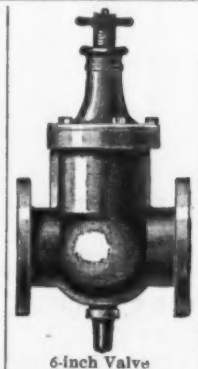
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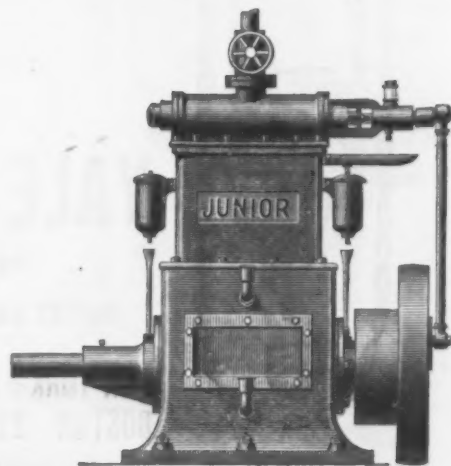
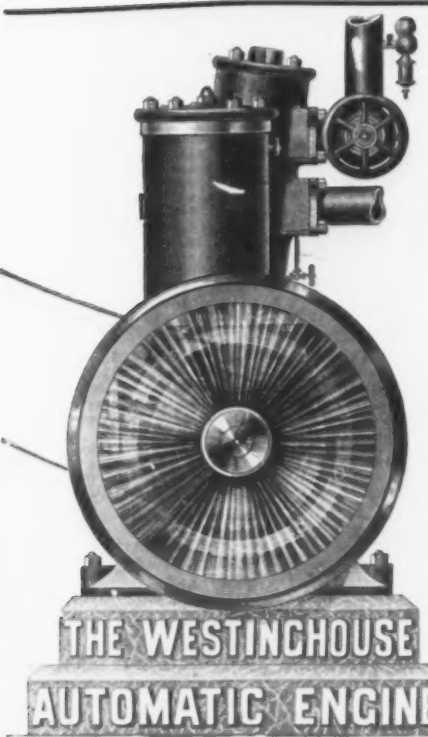
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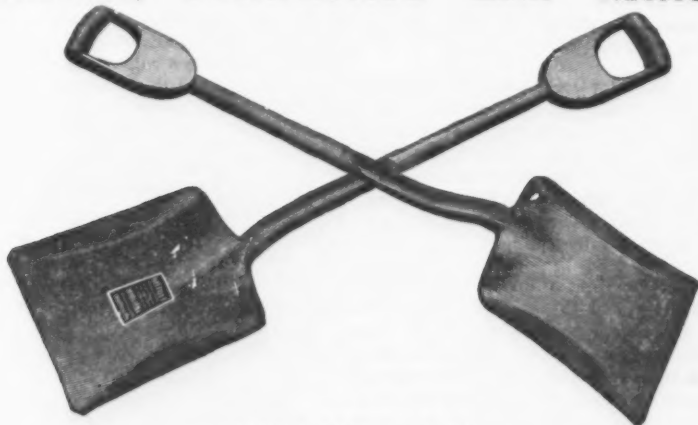
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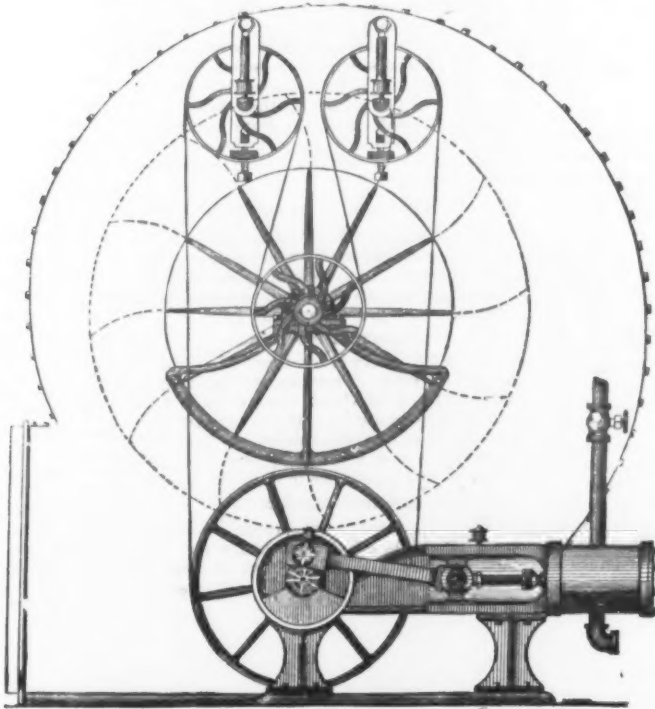
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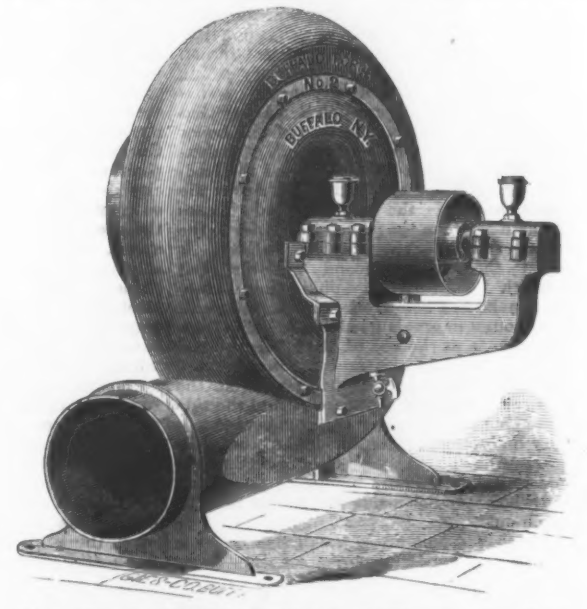
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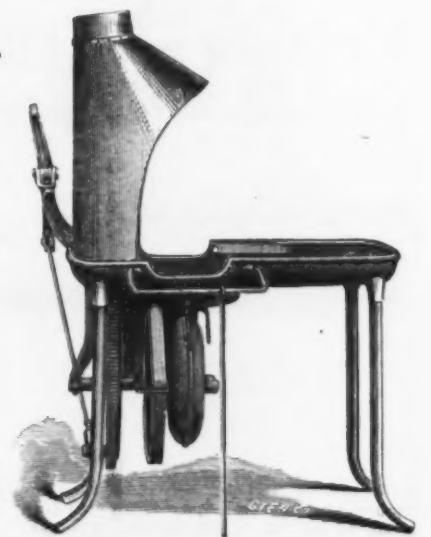
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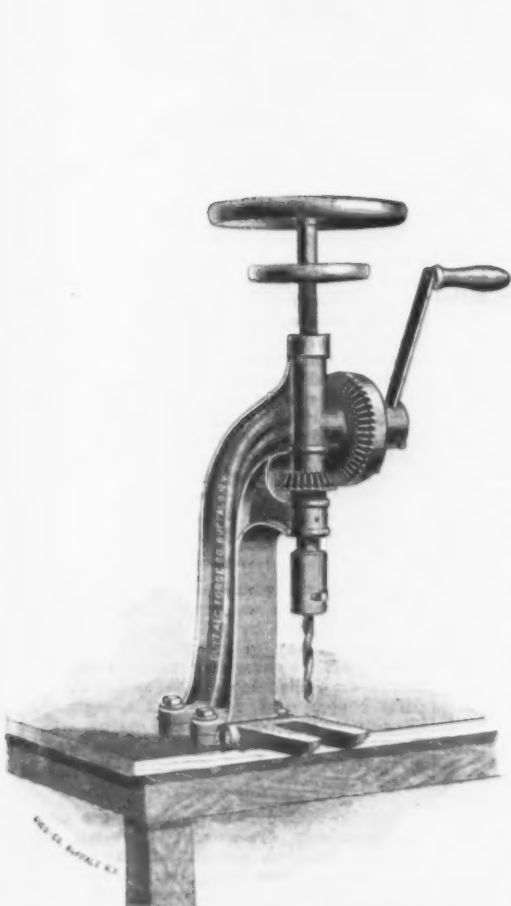
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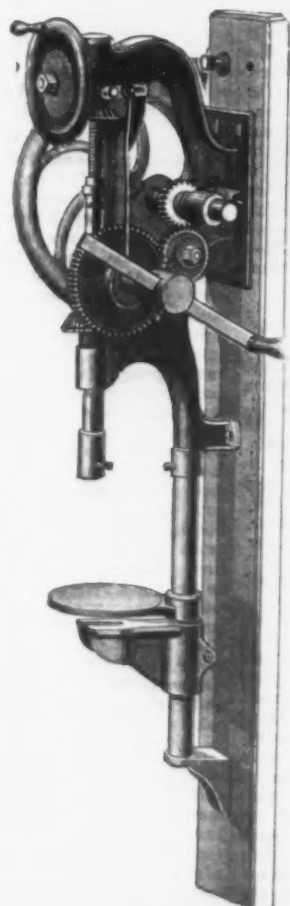


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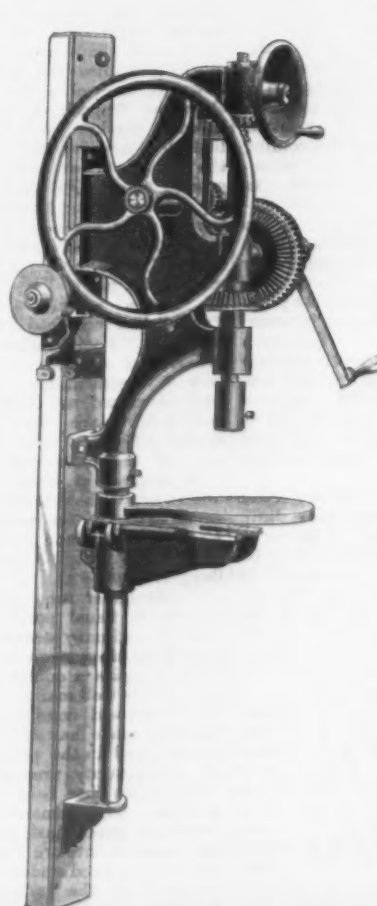
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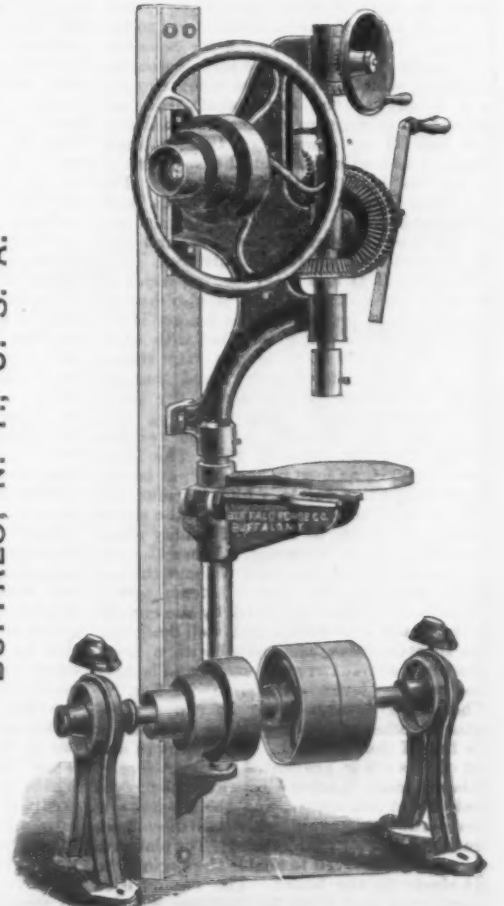


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3750	66,230	43,420	27.00 %	48.83 %
3751	66,960	41,990	27.00 %	49.39 %

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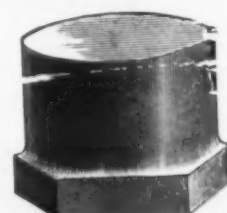
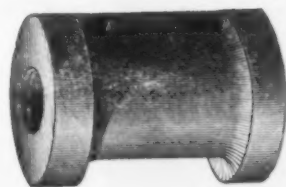
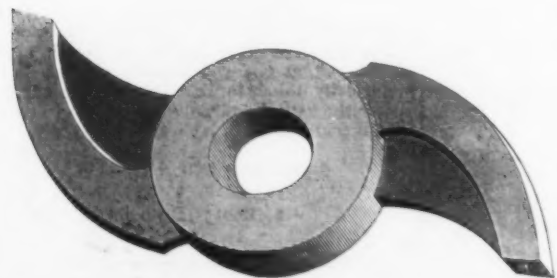
Blow.	Tensile Strength.	Elastic Limit.	Elongation.	Reduction.
1159	82,840	50,030	21.25 %	43.31 %
1161	84,980	51,060	21.50 %	42.37 %
1162	84,660	51,040	22.00 %	41.55 %

RIVET STEEL.

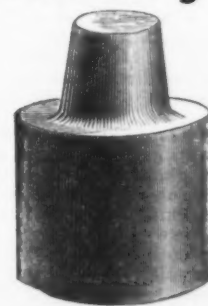
Blow.	Tensile Strength.	Elastic Limit.	Elongation.	Reduction.
3809	60,180	35,270	30.25 %	55.31 %
3814	55,990	35,000	33.25 %	63.16 %
3817	56,220	35,160	28.25 %	57.58 %

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MADE FROM CRUCIBLE STEEL.



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Forged and Tempered.



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WE HAVE FURNISHED

CAMS AND TAPPETS FOR
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SOFT CRUCIBLE STEEL, 10 to 15 Carbon, GOOD WELDING QUALITY.



Perfect Wheel, Weight 15 lbs.



Same Wheel after 7 falls of
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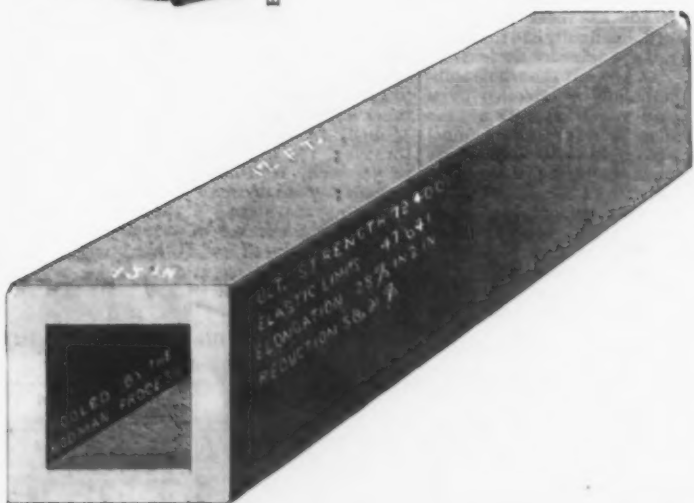


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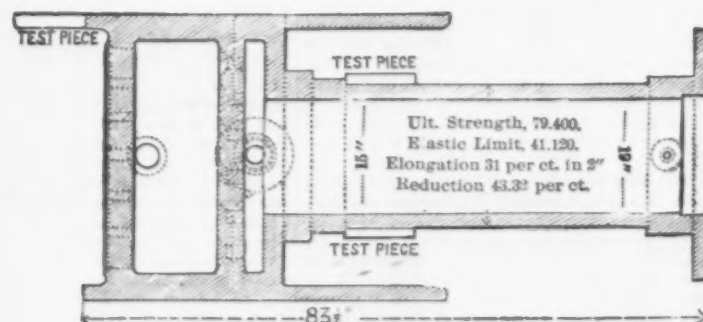


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Weight 11,300 lbs.



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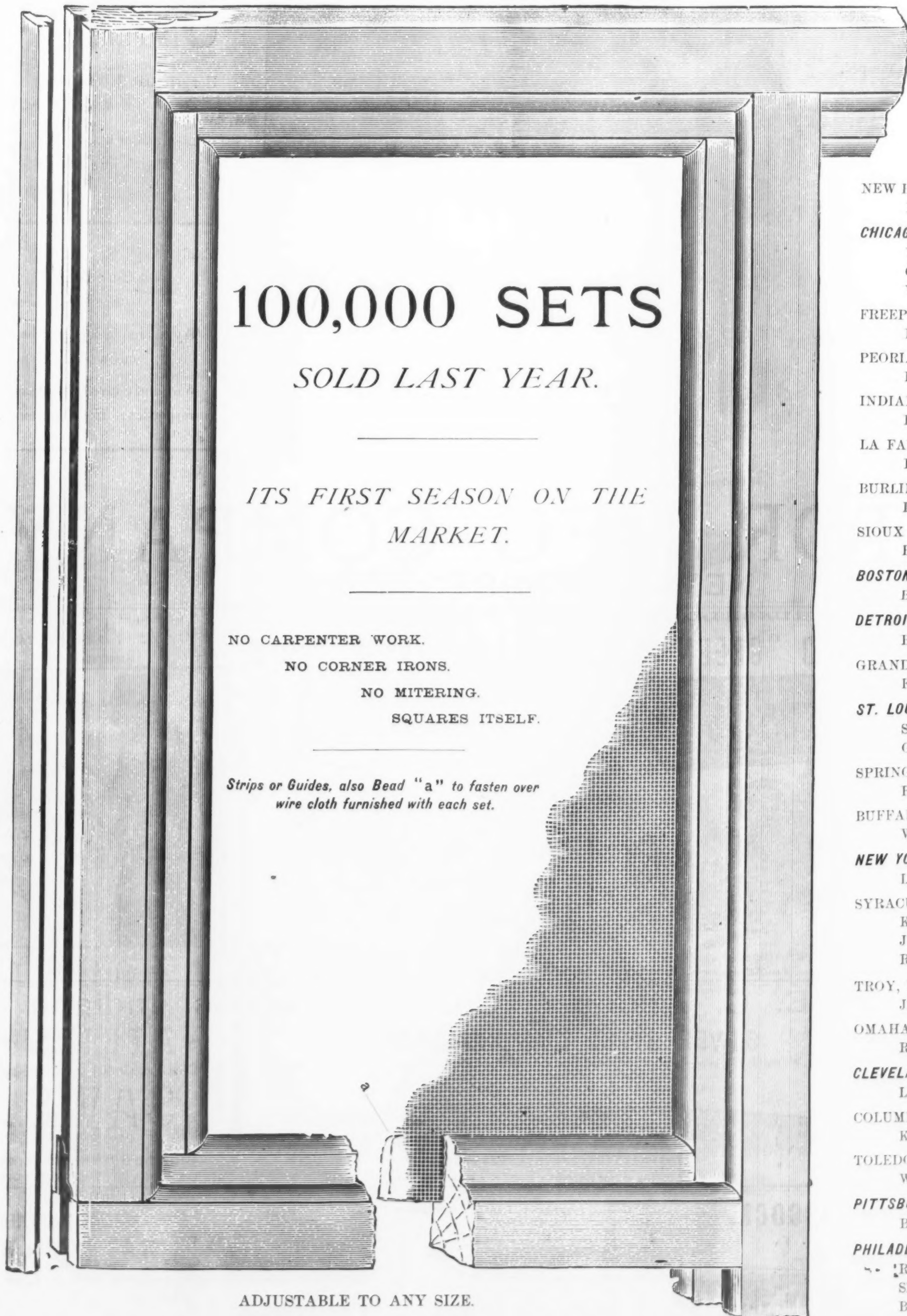


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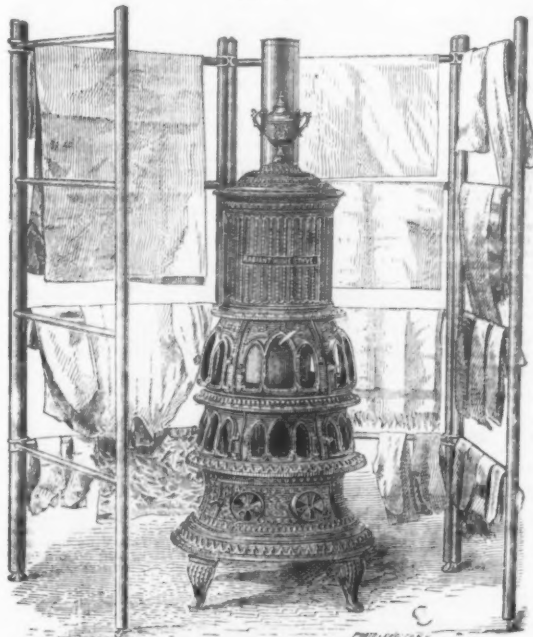
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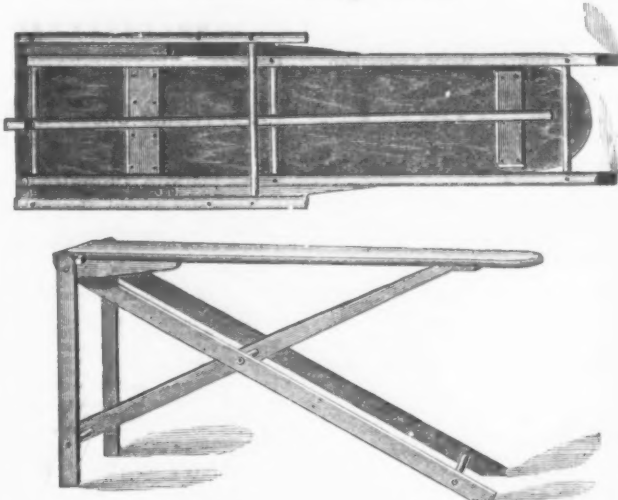
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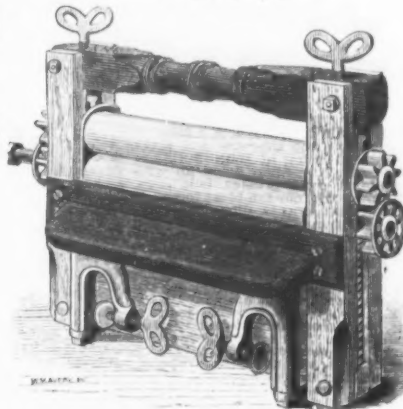
Reversible Clothes Horse.
PATENTED.



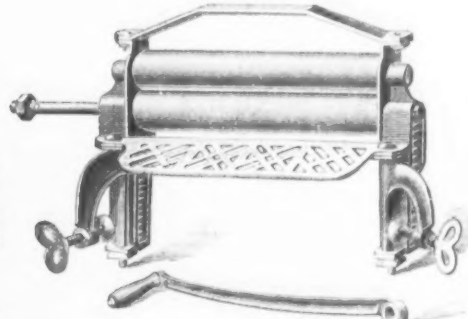
Adams Ironing Table.



Keystone Wringer.
Laundry and Factory Size.



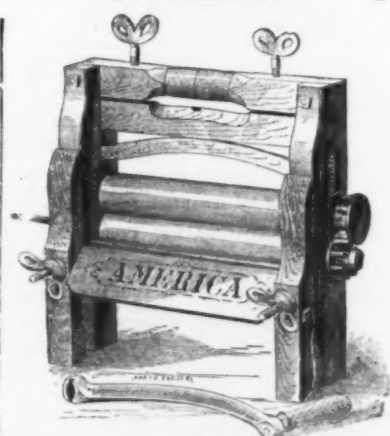
Our New Style.
No. 11.



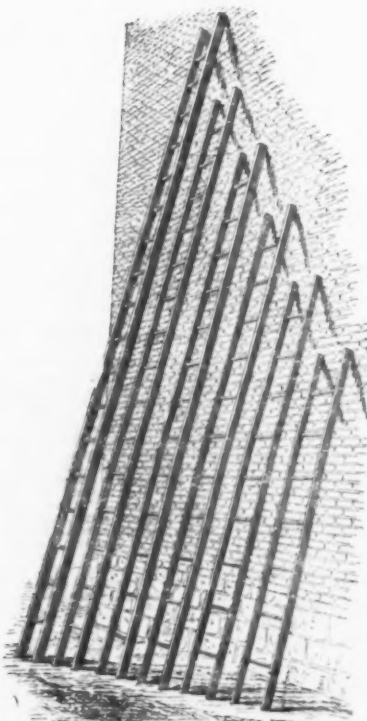
Adams Swing.



The American Wringer.
No. 8. FAMILY SIZE.



Common Ladders.
From 10 to 20 Feet.



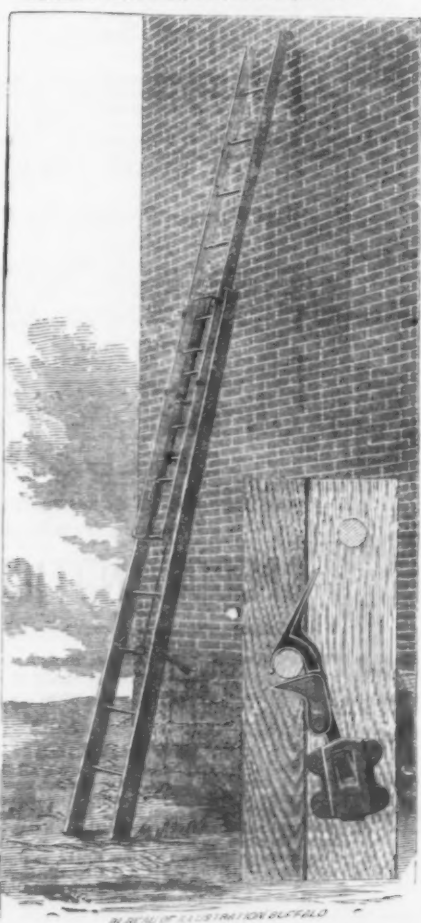
Keystone Double Bench Wringer.
Price to the Trade, \$48.00 per Dozen.



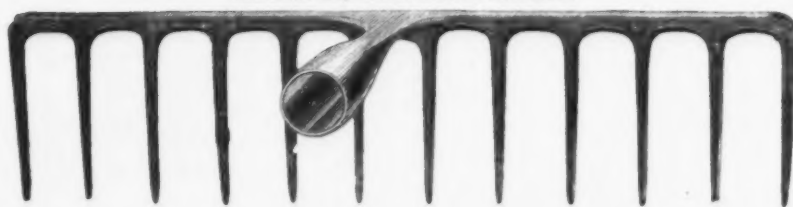
Lovell's Lock-Hinge Step Ladder.
Patented April 16, 1872, and March 11, 1873.



Lovell's Patent Extension Ladder.
Patented October 22, 1867, and August 4, 1874.



Keystone Socket Rake.
This is the only Socket Rake in the market.



Ideal Mouse Trap.



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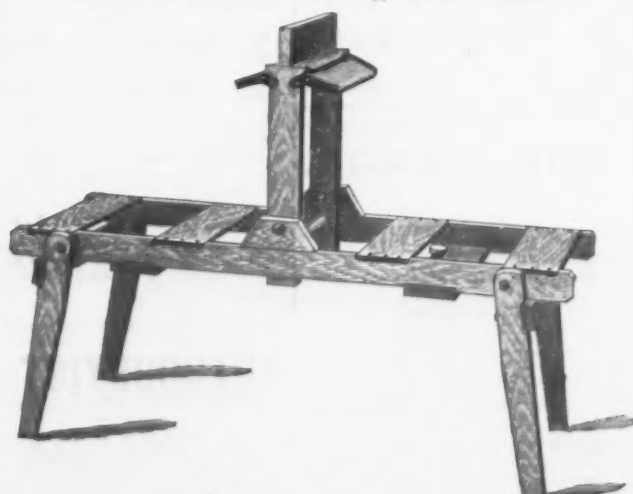
Adams Platform Truck.
SIX WHEELS.



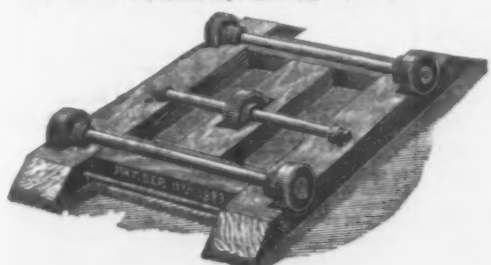
The Jungbluth Lawn and
Street Sprinkler.



Adams Double Folding Wash Bench.



The Adams Iron Wheel Truck.
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MARCH 2, 1887.

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Double Waterproof, in 1-10's	\$1.40
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Cent. Fire Cartridges, Military & Sporting, .22 cal.	dis 30¢ 2
Blank Cartridges, except .22 and .32 cal., an addition 10 % over above discounts.	
Rim Fire Cartridges, .22 cal.	\$1.50, dis 2
Rim Fire Cartridges, .22 cal.	\$3.40, dis 2
Primed Shells and Bullets	dis 25¢ 2
B. B. Caps, Round Ball, .22 cal.	\$1.00, dis 2
B. B. Caps, Conical Ball, Swaged	\$1.75, dis 2

Primers
 Berdan Primers, all sizes, and R. L. Caps (for
 Sturtevant Shells).....doe, dis 2 1/2
 All other Primers, all sizes.....\$1.10, dis 2 1/2

Shell
 Paper Shot Shells, 1st & 2d or S. G. qual.....dis 15¢ & 2 1/2
 Selfhold's Combination Shot Shells.....dis 15¢ & 2 1/2
 Paper Shot Shells, Club, Royal, Climax.....dis 15¢ & 2 1/2
 Paper Shot Shells, Star Brand.....dis 25¢ & 2 1/2
 Brass shot Shells, 1st quality.....dis 60¢ & 2 1/2
 Brass Shot shells, Club, Royal & Climax.....dis 65¢ & 2 1/2

U. M. C. & W. R. A.—B. E., 11 up.....	\$2.00	} dis 20&2 g
U. M. C. & W. R. A.—B. E., 9&10.....	2.50	
U. M. C. & W. R. A.—B. E., 7&8.....	2.60	
U. M. C. & W. R. A.—P. E., 11 up.....	3.10	
U. M. C. & W. R. A.—P. E., 9&10.....	4.00	
U. M. C. & W. R. A.—P. E., 7&8.....	4.90	
Eley's B. E., 11 up.....	\$1.75	
Eley's P. E., 11 @ 20.....	\$2.80	

Anvils - Eagle Anvils.....	\$ 10.
"right"	95¢
runt's Mouse Hole.....	11¢
runt's Mouse Hole, Extra	11¢
'renton	95¢ @ 10¢
'rkinson	95¢ @ 10¢
J. & Riley Carr. Patent Solid.....	11¢ @ 11¢
Steel Vise and Drill— Hess, Ellis Co.....	\$18.00. dia 20%

New-Artil and Viso .....	.....	dhs 25 g
Allen Combined Artil and Viso .....	.....	.63, dhs 40 & 10 g
Morre & Hayden Mfr.Co., No. 2 regro., \$30; No. 3, \$90		
Sugars and Bile.		
Dou-class Mfr. Co.....	.....	dhs 60 & 10 g
New Haven Copper Co.....	.....
Nm. A. Ives & Co.....	.....	dhs 60 & 10 g

Humphreysville Mfg. Co. dis 55 ¢
 French, Swift & Co. (E. H. Beecher) ...
 Connecticut Valley Mfg. Co. dis 55 ¢
 New England Mfg. Co. dis 55 ¢
 New Haven Copper Co. dis 50¢ 10¢ 50¢ 10¢ 5¢
 Circular Lip dis 60 ¢
 Patent Solid Head dis 30 ¢
 E. Jennings & Co., No. 18, extension lip dis 40 ¢
 E. Jennings & Co., No. 30 dis 60 ¢
 E. Jennings & Co., Auger Bits, in fancy boxes,

Levis' Patent Single Twist.....	dis 20 1/2
Russell Jennings' Augers and Bits.....	dis 45 1/2
Imitation Jennings' Bits, new list.....	dis 25 1/2
Car Bits, Snell Mfg. Co.....	dis 50 1/2 to 60 1/2
Car Bits, New Haven Copper Co.....	dis 40 to 10 1/2
'Hommedieu Car Bits.....	dis 50 1/2 to 10 1/2
Forstner Pat. Auger Bits.....	dis 15 @ 20 1/2
Follow Augers—	dis 10 1/2

Ives		{ dis 25&10 @
French, Swift & Co.		{ 25&10&5 @
Douglas'		
Suspensive Bits—		
Clark's small, \$18; large, \$26.....	dis 35 @	85&5 @
Ives' No. 4, per doz., \$60.....	dis 35 @	40 @
Swan's		dis 40 @
Steer's, No. 1, \$20; No. 2, \$22.....	dis 35 @	
Tanner's Adjustable # doz., \$48.....	dis 40@10 @	

stearns' Adjustable # doz. \$48.....	dis 20% 10
Ives' Expansive, each \$4.50.....	dis 45 % 50
Universal Expansive, each \$4.50.....	dis 20 %
Food's.....	dis 25 @ 25% 10 %
Gemset 2500—	
Common.....	# gross \$5.00 @ \$3.25
Diamond.....	# doz. \$1.10, dis 25% 10 %
See.....	dis 25 %
	dis 45 %

Double Cut, San Valleys Mfg. Co.	dis 30x10 1/2
Double Cut, Ct. Valley Mfg. Co.	dis 30x10 1/2
Double Cut, Hartwell's, 6 gro, \$2.50	dis 40x10 1/2
Double Cut, Douglass	dis 40x10 1/2
Double Cut, Ives	dis 50x10 1/2 @ 10 1/2
66 Stock Drills—	
Morse Twist Drills.....	dis 40x10 1/2
Standard	dis 50x10 1/2
Cleveland	dis 50x10 1/2

Syracuse, for metal	dis 30	30¢ 10 ¢
Syracuse, for wood (wood list)	dis 30	30¢ 5 ¢
Williams' or Holt's, for metal	dis 50	10¢ 10 ¢
Williams' or Holt's, for wood	dis 40	10 ¢
Ship Auger and Bits—		
L'Hommiedieu's	dis 15	20 ¢
Xatrous's	dis 15	20 ¢
Urell's	dis 15	20 ¢
Urell's Ship Auger Pattern Car Bits	dis 15	20 ¢

Awl Hatts.
 Swing, Brass Ferrule.....\$3.50 * gross—dis 45¢10 %
 Patent Sewing, Short.....\$1.00 * doz—dis 40¢10 %
 Patent Sewing, Long.....\$1.20 * doz.—net
 Patent Peg Plain Top.....\$1.00 * gross—dis 45¢10 %
 Patent Peg Leather Top.....\$1.20 * gross—dis 45¢10 %

Awls, Brad Sets, &c.
 Awls Sewing Common..... * gross \$1.70—dis 35 %

wis. Shouldered Peg..... $\frac{1}{2}$ gross \$2.45—dis 40¢ 10x10 ½
wis. Patent Peg..... $\frac{1}{2}$ gross .68¢ do 40x10 ½
wis. Shouldered Brad.....\$2.70 $\frac{1}{2}$ gross—dis 35 ¢
wis. Handled Brad.....\$.75 $\frac{1}{2}$ gross—dis 45 ¢
wis. Handled Scratch.....\$.75 $\frac{1}{2}$ gross—dis 35x10 ½
wis. Socket Scratch.....\$1.50 $\frac{1}{2}$ doz—dis 25 ¢ 30 ¢

Awl and Tool Sets.

Ken's Sets. Awls & Tools, No. 20, $\frac{1}{2}$ doz. \$1.00—dis 50¢ 10 ½
Ken's Sets. Awls & Tools, No. 20, $\frac{1}{2}$ doz. \$1.00—dis 50¢ 10 ½

1st and 2nd Bets. 42, \$10.00. No. 43, \$12.50. dis 70 & 10 & 5
 1st and 2nd Bets. Stanley's Excelsior, No. 1, \$7.50. { dia 30 & 10 & 5
 1st and 2nd Bets. Stanley's Excelsior, No. 2, \$4.00. { dia 30 & 10 & 5
 1st and 2nd Bets. Stanley's Excelsior, No. 3, \$5.50. { dia 30 & 10 & 5

First quality.....	per doz	\$7.00	or	\$7.25
Others	per doz	\$6.50	or	\$6.75

Axis Grease.

Asers, in bulk.....	per keg	\$3.49	Pail, per lb.	5c net
Asers, in boxes.....	per gross	\$9.50		
Asers' Everlasting, in bxs., per doz., 1 lb.		\$1.20	per lb.	8c
Asers' Everlasting.....	per 10-lb. pails, each	86c		
Water grades, special brands.....	per krol	\$5.50	or	\$7

xies. - Nos. 1 to 6	34¢	Short bed, 45¢
7 to 18	50¢	50¢ to 60¢
19 to 22	60¢	60¢ to 100¢
23 to 26	50¢	50¢ to 10¢
National Wrought Steel Tubular Self-Opening		
standard Farm (1 to 5) and Special Farm (A1 to A5)	33¢	
less than 10 sets	33¢	
Over 10 sets	33¢	
Strong F.B. (6 to 9), & XX Strong Truck (10 to 16)		

Less than 10 sets.....	dis 10 g
Over 10 sets.....	dis 10x5 g
egg holders.	
Sprengle's Pat., 2 doz \$18	dis 60 g
Balances.—Spring Balances.....	dis 50 g
Simon 24d.....	2 doz., \$1.50—dis 50 g
Attilion's Spring Balances.....	dis 50 g
Attilion's Circular Spring Balances.....	dis 60 g

Light Brass.....	dis 75&10 @ 75&10&5	H
Extra Heavy.....	dis 65&10 @ 70	H
Heavy Metal.....	dis 70 @ 70&10	L
Iron Chime.....	dis 25&10&5	B
Jobe (Cone's Patent).....	dis 25&10 @ 35	
Long, Abbe's.....	dis 25&10 @ 35	N

Yankee	dis 40x10	AL
Horton's	dis 40x10 ea 50	
Taylor's	dis 25x10	
Brooks'	dis 50x10x2	
Cone's	dis 10	
Connell's	dis 20x10	
Sargent's	dis 60x10	
Taylor's Bronzed or Plated	net	
Taylor's Japanned	dis 25x10	
R. E. W. Co's	dis 50x10x2	

Ill. Brook's	dis 50x10x2 1/2	Eu
Ill. Western	dis 25x10	Se
Common Wrought	dis 60x10 1/2	Sp
Western	dis 20x10 1/2	W
Western, Sargent's list	dis 70x10 1/2	Un
Kentucky "Star"	dis 20x10 1/2	Do
Kentucky, Sargent's list	dis 70x10 1/2	Do
Edge, Genuine Kentucky, new list	dis 70x10 1/2	g

Star.....	dis 50x10 @ 80x10x5	Ho
on Bells.....	dis 40x40x5	Co
Alloy Church and School Bells.....	dis 40x	W

ippers.—See Compasses.	
Owners.	
Anger's Comet.....	dos \$3.00, dis 25 %
ican.....	dos gross \$3.00
ix.....	dos 25¢, dis 15 % 20 %
u's.....	dos \$3.75, dis 20 %
French.....	dos \$2.25, dis 55 % 60 %
Iron handle.....	dos gross \$3.00, dis 45 % 50 %

ne Scleros.	dos \$2.50, dis 10	Nath
	dos \$7.00, dis 55	Pat
	dos \$5.00, dis 25	Stam
ue, No. 1. 2, \$2.25; 3, \$2.50.	dis 50 & 10	King
Best, gross, No. 1, \$12.00; No. 2, \$24.00.		Acem
\$30.00.	dis 50 & 10	Dup
ral.	dos \$3.00, dis 35	Rap
tic	dos \$2.50, dis 45	Triu
plom.	dos \$2.00, dis 50	Adv
da		

and Curry.....	dis 10 @ 10	10 %	Brya
a.....	New list, Aug., 1883,	dis 10 %	Ayre
.....	dis 10 %		El

Land	.....	dis 50¢10 & 10	Rienan
Land	.....	dis 50¢10 & 10	Lane s
Land	.....	dis 50¢10 & 10	The Be
Land	.....	dis 50¢10 & 10	Warne
Land	.....	dis 50¢10 & 10	Stearn
Land	.....	dis 50¢10 & 10	Faultie
Land	.....	dis 50¢10 & 10	Ameri
Land	.....	dis 50¢10 & 10	Rider a
Land	.....	dis 50¢10 & 10	Parago
Land	.....	dis 50¢10 & 10	Parago

T. & S. Mfg. Co. l.	gro, \$17.00, dis \$394	Crescent
(Standard Co.)	gro, \$17.00, dis \$18.00	Hart
n (Standard Co.)	gro, \$10.00	Isiah
Standard Co.	gro, \$7.50	Hunt
(Standard Co.)	gro, \$7.50	Isiah
Standard Co. l.	gro, \$12.00	Hunt
(T. & S. Mfg. Co. l.)	gro, \$15.00	Hunt
No. 1.	gro, \$10.50	Buffalo
No. 2.	gro, \$10.00	Hurd
		York

.....	W dos \$2.00	Underh
.....	W gro \$5	C. Ham
Eric Bell Sets.—Wollensak's.....	dis 20 g	Simmon

Self Anti-Friction.....	dis 30 1/2 @ 20 1/2 10	Furniture
Clearing Door Hanger.....	dis 40 1/2 @ 10	Base, Rub
Patent.....	dis 20 1/2 @ 25 1/2 10	Picture, J
Anti-Friction.....	dis 20 1/2 @ 20 1/2 10	Picture, S
	dis 40 @ 20 1/2 2	Picture, M
	set 6: dis 20 1/2 @ 10	Shutter, L
Poster, No. 1, 621 1/2; No. 2, 75 1/2	dis 40 1/2 @ 10	Carriage
No. 1, 2 and 3.....	dis 40 1/2 @ 10 1/2 10	Ladies
No. 4, 5, 5 1/2 and 6.....	dis 25 1/2 @ 10	Well

.....	dis 00200020	Melting, I
See Snaps.—See Snaps.		Melting, I
ers.—List Jan. 1, 1886.		Melting, I
nd		Melting, V
ngling Lath and Claw.....	dis 35 40 40	Laurel
oad.....	dis 40 25	Fabular, I
	dis 40	Fabular, I
ammer Co.....	dis 40 100 50	Fabular, I
	dis 40 25 40 10 50	Fabular, I
Piumb.....	40 25 25	Fabular, I

Edge Tool Co.....	dis 4025 @ 40	10	Guards for
ad & Son.....	dis 40210 @ 50	5	Police, Sm
.....	dis 35 @ 40	5	Porter's T

Good Screws	.....	gross 100	dis 10	\$
Tip	.....	dis 25	\$10	\$
Tip	.....	dis 70	\$10	\$
Tip	.....	dis 80	\$10	\$
Tip	.....	dis 68	\$10	\$
Tip	.....	dis 35	\$5	\$
Tip	.....	dis 65	\$10	\$
Tip	.....	dis 60	\$10	\$
Tip	.....	dis 55	\$10	\$

... ..	dos 35.10	40 %
roe's Patent	dos 44.00	40 %
& W	dos 35.10	40 %
ner's	dos 30%	
9, without Guards	dos 35.75	
wire. No.0, without Guards	dos 35.50	
ge Tip No. 0, without Guards	dos 36.25	
om Lift, without Guards	dos 36.25	
Safety Lift Wire noGuards	dos 35.00	

10.00; Med.\$7.25; Large, \$4.75. disc20-25
 is. B. \$10 disc20

Mansfield's Self-Sustaining Automatic Rope Blocks.

Topping & Fox, 95 Chambers street, New York, are putting on the market these blocks, which are represented in the accompanying illustrations, which explain their construction and special features. Fig. 1 represents an iron three fold rope block sustaining a weight with a chain sling, and Figs. 2 and 3 give sectional views showing the action of the grip. Fig. 2 is a sectional view of the standing block showing the



Fig. 1.—Mansfield Self-Sustaining Automatic Rope Blocks.

grips A, B and C, through which the haul rope L is working, being held by the grip rings which are attached to the grip frame F, working freely on pins. On the opposite side the grips A, B and C are connected to the stem D in such a manner that the stem D moves the grip up and down, to grip the haul rope L in the upper tendency and to release it on the upward tendency, as shown in Fig. 3. In order to allow the tackle to be overhauled, the release cord H is held down as shown in Fig. 3, and the haul rope is then free to work either way. When the cord H is released the grip is inclined upward by the action of the spring E, which makes the grips act more quickly. The point is emphasized that the greater the load the firmer the grip holds, and that the

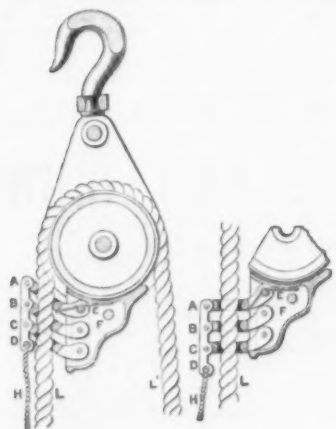


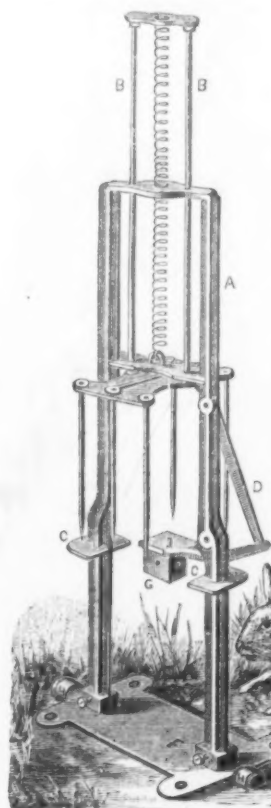
Fig. 2.—Sectional View. Fig. 3.—Grip Released.

action is perfectly automatic and safe, working instantaneously. It is stated that the grip would hold securely even if the rope were worn away half its original size. This device is alluded to as being applicable to all tackle blocks, either wood or iron, and is stated not to increase the bulk of the block, and adding to the weight of any block, say for an inch diameter of rope, only about 1½ pounds. It is also stated that for the machine shop, in the erection of machinery and lifting heavy pieces in lathes, planers and drills, as well as in other uses, one man's service may be dispensed with and a finer adjustment had than can be obtained by the chain block. This grip device is also applied to hand hoists of every description, dumb-waiters, merchandise and wheel and dumb hoists for stores, factories, mills, &c.

Olmsted's Animal Trap.

This trap is illustrated in the accompanying illustration, and is made by L. H. Olmsted, Corona, N. J., whose mole trap, the essential portion of this, has been made for some time, and is familiar to the trade. The trap represented in the cut consists of the mole trap with an attachment adapting it for use above ground in catching rabbits, opossums, skunks, &c. The attachment consists of the block G and the iron plate F, which are constructed so as to receive the legs of the trap, and are secured to the trap by two screws. The block G is attached by a spring clamp to the under side

of the trigger E, and is provided with holes through which strings are passed in fastening on the bait. Two iron staples, H H, are furnished with the attachment to be used in fastening the plate F to the ground, and holes for screws are also made in the plate, as indicated, and screws furnished, so that it may be fastened to a floor or board when desired. It may be added in further description of the trap itself that it consists of the frame A constructed with two cross bars in which are holes to guide the needle bars B B. At the lower end of the needle bars is attached a plate to which six needles are made fast, three on each side of the plate. To the upper end of the needle bars is attached a platform for the purpose of holding a weight, either a brick or stone, which serves to operate the trap when set off by the mole. Springs are also furnished



Olmsted's Animal Trap.

to operate the trap. The spring can be readily attached and detached, it simply being hooked to the trap, so that either a weight or spring can be used to operate it. To the frame is attached the lever D and trigger E, both made to work loosely on pivots. This trap is constructed entirely of steel and iron.

The Cheney Lawn Mower.

This machine, which is the invention of C. W. Cheney, Athol, Mass., is manufactured by Mather & Todd, Leominster, Mass., and is represented in the illustration given below, from which it will be observed that it is a radical departure from the style of lawn mowers in general use. The knives are arranged in two sets and make a regular shear cut. They are operated by a double crank motion which is described as very rapid. They are not shaped like the knives of common mowing machines, as they have one straight and one slanting side. They can be sharpened, it is claimed, by any one of ordinary intelligence, and can be taken out to grind by the removal of three screws, and as there is but one way they will go back, it is impossible to replace them in a wrong position. The parts are all made interchangeable. The advantages which are alluded to as possessed by this machine include among others the following: That the mower will cut anything in the shape of grass, whether short or tall, weeds, clover, &c.; that the wheels do not run in the standing grass; that it will cut all the grass up to a stone wall, fence or tree without using a sickle or knife; that it will cut a lawn as close as any rotary machine, and that it works easily, and is not liable to get out of order. It is also claimed that it can be used with profit to trim up in



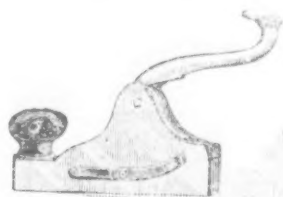
The Cheney Lawn Mower.

a field after a horse machine. It is made at present in 10, 12, 14 and 16 inch sizes, and it is expected that others will soon be made.

Blind Nailing Machine.

Stranahan Bros., Minneapolis, Minn., are manufacturing the Stranahan Blind Nailing machine, which is represented in the accompanying illustration. As its name indicates, it is used for raising the wood for blind nailing, and for this purpose has a bit or chisel which is operated by the lever shown in the cut. The instrument is placed on the wood and held in position by one hand, when

by a pressure of the lever the bit is carried downward into contact with the wood, when by a continued movement of the lever it is forced the proper depth into the wood, and then carried along horizontally the requisite distance, so as to raise the grain sufficiently to permit the driving of the nail, and in such a form that it is not liable to break. The length of the instrument is about 4½ inches, and the width of the chisel about ¼ inch. Under the handle in front of the instrument rubber is placed to keep it from slipping. Through the opening in the top the screw holding the bit or chisel in position can readily be reached, so as to permit its removal for sharpening, or its adjustment, so

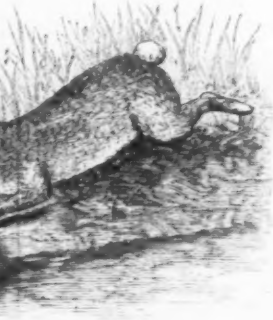


Stranahan Blind Nailing Machine.

that it will cut deeper or shallower. A spiral spring under the lever forces it up when the pressure is withdrawn. The machine is neatly and well made, and nickel plated. In alluding to it the manufacturers call attention to the facility and accuracy with which it works, and also give directions in regard to its use.

L. C. Smith Hammerless Gun.

L. C. Smith, Syracuse, N. Y., is making a new hammerless gun, illustrated in Fig. 1



the cocking and safety mechanism of which is shown in Fig. 2. Attention is called by the manufacturer to the mechanical movement for cocking the tumblers as a device commending itself for simplicity, reliability and ease of manipulation. The gun has steel-freed bridled locks with interchangeable main springs, and these locks are referred to as taken out for oiling and inspection as readily as the locks of a hammer gun. Attention is specially called to these points: That there is but one spring in each lock, instead of three or four, as is the case with others; that the cocking device has no springs whatever, and that there is no thrust on the four end either in cocking or extracting shells, a point on which they lay special emphasis as possessed

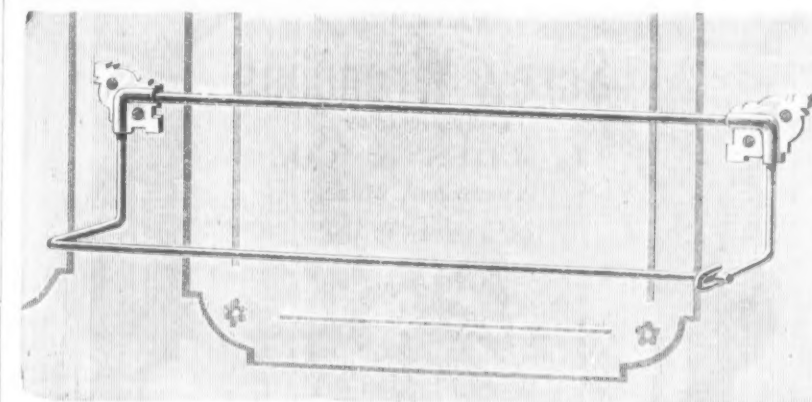


Fig. 1.—The L. C. Smith Hammerless Gun.

by no other hammerless gun. It is also claimed that the gun has an exceptionally well proportioned frame, giving it special merit for symmetry of outline, hang, balance, &c. From the accompanying cut it will be seen that the mechanism of this gun is similar to that of their hammer gun, and of it the following description is given:

Our gun is distinctively a top-action gun, bolted or locked at as great a distance as is practical from the hinge joint, to utilize the advantage of a long leverage, thus reducing the strain on the bolt mechanism to the lowest possible minimum. The rotary bolt is made from one solid piece of steel, and is provided with a strong forward arm, which passes completely through the mortise in the extension of the rib and under the solid

in two bearings 1½ inches apart, which prevents the lever from lopping and rubbing the tang when turned for opening. The connections between the lever and bolt are such that no lost motion can occur; the bolt



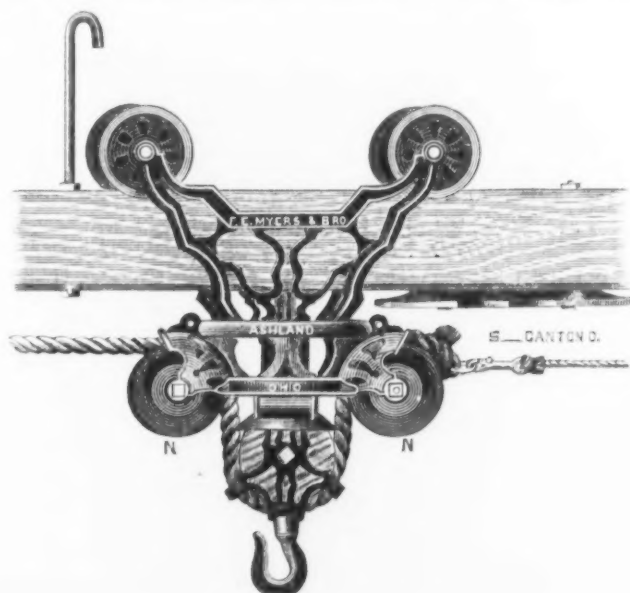
A New Towel Rack.

spring is longer than is used on other guns, thereby reducing the liability of breaking, besides making a more elastic and better working spring. A trip holds the locking bolt drawn until the barrels are closed; hence, no wear occurs at this point and less effort is required in closing the gun. Our patent drop extractor allows the shells to be pushed entirely home before attempting to

is commended for its simplicity, neatness and durability.

The New Myers Combination Carrier.

The cut given herewith represents the Myers Combination Reversible Carrier with swivel attachment, which has recently been



New Myers Combination Carrier.

close the gun, and has strength enough to withdraw any tight shell.

In his circular relating to this gun Mr. Smith alludes to the combined automatic and independent safety found in it, as adapting the gun to use in the field and at the trap, making the point that in an instant the shooter can change his safety from automatic to independent, and vice

put on the market by F. E. Myers & Bro., Ashland, Ohio, thus still further enlarging the variety of these goods. It will be observed that this carrier is a straight reversible carrier, having the special features and advantages of the double lock reversible made by the same manufacturers, and that it has in addition a swivel attachment. This is alluded to as making it a complete machine, and adapting it to the requirements of the dealer to sell by, and rendering it exceptionally convenient and efficient for use as a hay and merchandise carrier. It is made to run on either a 4 x 4 wood track or on Myers's patent steel track, and is described as made of malleable iron, thoroughly reliable, of a neat pattern and well finished.

In order to show that under certain circumstances war does not really cause a great decline in the production of iron, the *Eisenzeitung* quotes the following figures of output in Germany:

	1870.	1871.	1872.
Iron ore.....	3,159,425	2,927,526	3,392,595
Pig iron.....	1,334,419	1,317,220	1,318,625
Castings.....	229,859	226,430	315,419
Bar iron.....	742,028	740,530	817,657

During the Franco-German war; therefore, the make of the German works were little affected. The records of France probably tell a much different story, however.

A business index is afforded by the unprecedented demand for office buildings in New York City, where Western firms and foreign agencies seek to be represented.

At the last meeting of the association of German Iron and Steel Manufacturers, Dr. Wedding described a method for the estimation of phosphorus, communicated to him by George W. Goetz, of the Otto Iron and Steel Company. With the aid of this

A New Towel Rack.

The accompanying illustration represents a new patented towel rack that is manufac-

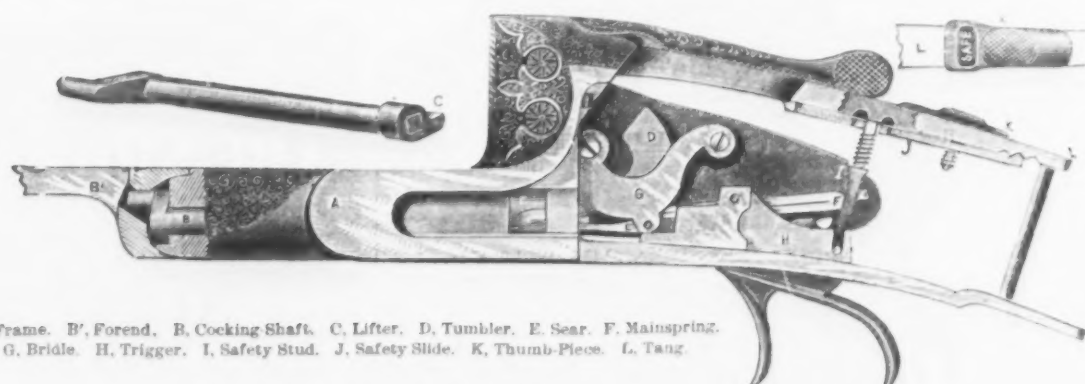


Fig. 2.—Cocking and Safety Mechanism.

metal of the frame ½ inch, which, together with the backward flange passing through the slot in the end of the extension, makes the strongest possible fastening. The lever and post are forged from one solid piece, thereby avoiding the possibility of the lever becoming loose on the post. The post turns

ured and sold by M. C. Henley, Richmond, Ind. It will be observed that it is exceedingly simple in design and construction, consisting, as indicated, of one continuous piece of wire bent in the form represented and fastened to the wall as shown by the plates which are placed over the

method phosphorus can be estimated in half an hour, which is about the time required for the method first introduced at the works of Bolekow, Vaughan & Co., and since used at some American steel mills. Dr. Wedding has proved the Goetz method, and thinks that the time may be reduced to 15 minutes.

L. COES'
GENUINE IMPROVED
Knife Handle
PATENT
Screw Wrenches
MANUFACTURED BY
L. COES & CO.,
Worcester, Mass.
ESTABLISHED IN 1830.




Patented July 6, 1880. Patented July 8, 1884.
Registered March 21, 1874.

Sectional view illustrates our NEW KNIFE HANDLE, showing Malleable Iron Frame and Shank of Bar keyed into position.
Straight Bar, Extra LONG NUT FOR SCREW IN JAW.

The Best Made and Strongest Wrench in the Market.
Send for Illustrated Price List and Circular.

J. C. McCARTY & CO.,
NEW YORK,
Sole Agents.

ILLINOIS IRON & BOLT CO.,
Nos. 20 to 26 Main Street,
CARPENTERSVILLE, KANE CO., ILL.

Blacksmiths' Tools, Thimble Skains,



Tire Bender No. 2,
JACK SCREWS,
Track Jacks, Carriage Makers' Vises,
SAD IRONS, COPYING PRESSES AND STANDS, &c.

W. S. ESTEY, No. 71 FULTON ST., NEW YORK.
MANUFACTURER OF
Of Brass, Copper, Iron, Galvanized and Steel Wire of all Meshes and Grades. For Mining, Milling and all other purposes. Locomotive Park Wire Cloth, &c.
For Bank, Office and Counter Railing, Store Fronts, Window Guards, &c.




Lifting Machine. Decoy Rat Trap.

Galvanized Wire Cloth for Protecting Windows, Sky Lights, &c.
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IRON BOLTING CLOTH. SILK BOLTING CLOTH.
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S T PATENT SIFTER.
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Inverted—Showing Clamps. Showing Different Parts.

BUY THE
POWELL TOOL CO.'S Brands of AXES,
"Peerless," "Monarch" and "Old Hickory."
FINEST QUALITY, SUREST TEMPER AND
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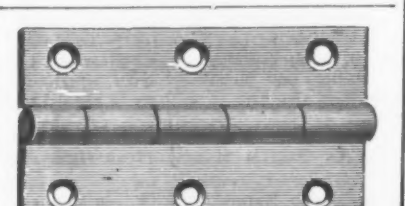
SEE THAT OUR STAMP IS IN THE HEAD OF EACH AXE. IT IS A GUARANTEE OF A 1 QUALITY.
All-Steel Axes, Hatchets and Adzes. Peerless Broad-Axes, the Best in the World.
Boys' Axes, Hunters' Hatchets, Bush Hooks, &c., of the Finest Quality.
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Manufacturers of
SPEAKING TUBES, WHISTLES, ELBOWS, ORAL ANNUNCIATORS, BELL & ELECTRIC WIRE TAPPING.
Complete Outfits of Speaking Tubes, Whistles, Pneumatic Bells, &c. A full line of Speaking Tube Hardware constantly on hand. Catalogues on application. Factory, DeKalbe, near Knickerbocker, Brooklyn, L. I.





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THE LEVIATHAN
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Unsurpassed for
Strength, Durability and
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Made to any Length,
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Main Driving Belts.
Guaranteed to Run
Straight, Even Through-
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No Cross Joints, Un-
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Clings well to the Pulley,
Has no equal. In fact,
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BLOWERS & FORGES
Are the Leaders of the World.



An entirely novel construction. They have no equal. No Cog Wheels, Rat-chets, Pawls, Gum Balls or other Friction Devices to wear out in a short time. Easy Motion. Powerful Blast. Noiseless and Durable. Guaranteed to give entire satisfaction. Write for catalogue and prices.
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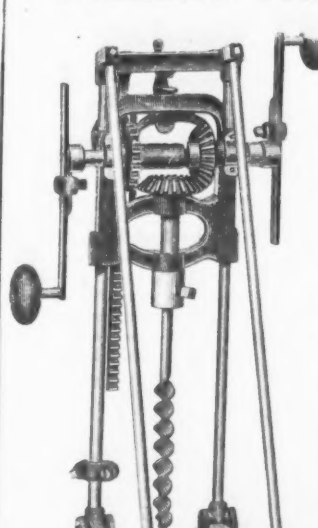
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The attention of Hematite ore miners is called to our new Jig. The simplest and most effective separator now in use.
McLANAHAN & STONE,
Gayport Foundry, Hollidaysburg, Pa.
Manufacturers of Ore Washers, Screens, Elevators, Conveyors, and general Ore Mining Machinery.

MILLERS FALLS BORING MACHINE.

THIS Machine has been fully perfected in all its parts, and is now sold with full warrant that it will do better work and give better satisfaction than any other kind in use. The frame is made of half-inch round steel rods; the braces are the same and attach to the rods at the top by a set screw. When this set screw is loosened, the frame falls over so as to bore at any desired angle.
The depth of hole to be bored is fixed by a stop, as seen on the left hand upright rod in the cut. When the gate strikes this stop a latch is lifted and the machine throws itself into gear by the use of a spring, and the Auger is lifted out of the hole by continuing to turn the crank in the same direction.
When the Auger is drawn from the hole the frame hangs itself up until the machine is moved to the next hole, then it is dropped down by turning the crank back until the Auger strikes the wood, when it is thrown out of gear and proceeds to bore the next hole. As seen in the cut, the machine has adjustable cranks which fully regulate its speed and power.





PRICES:

Machine, without Augers, - \$7.50
Augers in sets, 18, 23, 41 quarters.
\$3.00, \$3.75, \$6.75.
Sizes of Augers (1, 1 1/2, 2) (1, 1 1/4, 1 1/2, 2)
(3/4, 3/8, 7/8, 1, 1 1/4, 1 1/2, 1 3/4, 2).

MILLERS FALLS CO.,
74 Chambers Street, New York.

CHAMPLAIN
Forged Horse Nails.
MANUFACTURED BY THE
NATIONAL HORSE NAIL CO.,
Vergennes, Vermont.
HOT FORGED AND COLD HAMMERED POINTED. MADE OF BEST
NORWAY IRON AND WARRANTED.
WAREHOUSE
97 CHAMBERS AND 81 READE STREETS NEW YORK.
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WILMINGTON, DELAWARE,
New York Office, No. 221 Pearl, Corner Platt Street.
MANUFACTURERS OF
BEST CHARCOAL
BOILER PLATES,
AND PLATE IRON GENERALLY.
ALSO BEST QUALITY HOMOGENEOUS STEEL PLATES.

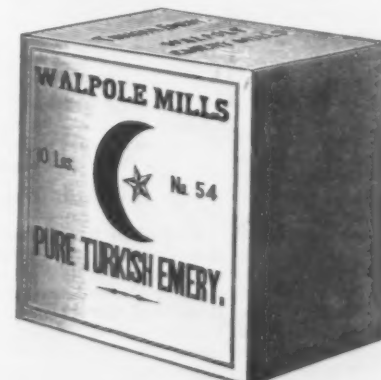
We ask the special attention of the trade to our C. H. No. 1 Boiler Plates, which we manufacture expressly for the Shells of Steam Boilers and stamp 50,000 pounds T. S. when desired. One hundred and sixteen tests of this iron, made during the last three years by the U. S. Inspectors of Steam Vessels, show an average tensile strength of 58,808 pounds to the sectional square inch, and an average reduction of area of the fractured section of 30% per centum. Our prices are as low as the production of a good article will admit of.

POTTSVILLE IRON & STEEL CO.,
POTTSVILLE, PA., Manufacturers of all kinds of
STRUCTURAL STEEL AND IRON
Viz., BEAMS, CHANNELS, TEES, ANGLES, PLATES AND BARS; Also STEEL
AND IRON AXLES FOR FREIGHT AND PASSENGER CARS.

This Steel is manufactured by the CLAPP-GRIFFITHS process, and is specially adapted, in addition to the above, for Boiler and Bridge Rivets, Wire Rods, Nail Plates, &c. &c. Our Mild Steel is well adapted for use in place of the best quality of Wrought Iron; where a greater strength and ductility is required, it welds readily as Iron. Also, Girders, Sills of all sizes and any desired temper. Shaping of all sizes in stock, from which prompt shipments can be made.

Brewery, Malt and Ice House Construction a Specialty.
Hermann-Parker
Hardware Mfg. Co.,
MANUFACTURERS OF
GREY IRON SHELF HARDWARE.

Our Specialties: Axle Pulleys, Well Wheels, Grind-stone Fixtures, Hay-fork Pulleys, Wash-boiler Handles, Store Lifters and Post Mauls.
Works: 11th and Papin and 12th and Gratiot Streets, St. Louis.
New York Office, W. E. Sabin, 96 Chambers St.





Manhattan Leather Works,

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THE INDESTRUCTIBLE COAT AND HAT HOOK;

Screws packed
with Hooks.

PATENTED.

This Hook is easily put
up and will last a life-
time, as it is made from
one continuous piece of
Steel Wire and will not
break or bend.



PRICE LIST.

No. 10, Coppered, per gross.	\$3.75
No. 20, Japanned, " "	4.25
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No. 40, C Tinned, per gross.	6.00
No. 50, Brass Plate, " "	12.50
No. 60, Bronze Plate, " "	12.50
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MANUFACTURED ONLY BY

THE PERKINS AND BRADLEY MFG. CO.,

MANUFACTURERS OF

Patented and Special Wire Hardware,

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SYRACUSE CHILLED PLOW CO.

SYRACUSE, N. Y.,

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Right & Left Hand Sulky Plows, Swivel Plows,
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LIGHT!
STRONG!
DURABLE!

No Hoops to drop off!
No Bottom to drop out!

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HANDSOME!

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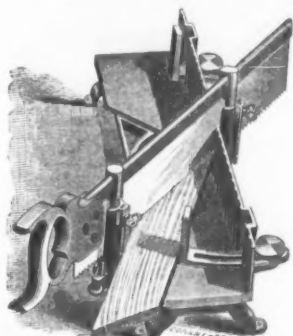
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Millers Falls, Mass.

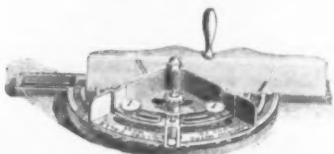


New Langdon Mitre Box Improved.

Cuts from right angles to 75 degrees.
The only Box adjustable for mitring circular
work in patterns, emery wheels and segments of
various kinds.

DISSTON & SONS' SAWS.

12 to 30 inches long.
2 to 6 inches wide on the back.



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Planes any possible angle.
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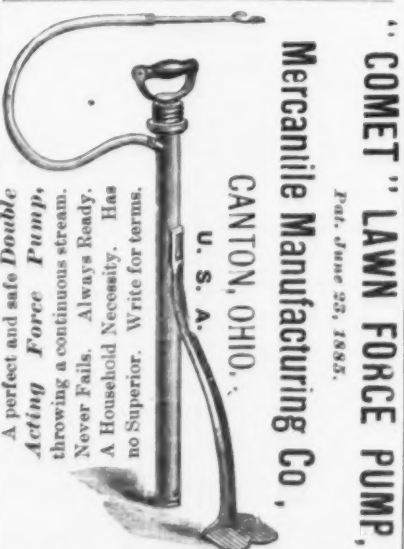


Any piece of ice that will go into the hopper
will go through, being drawn in by the peculiar
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other cutters.
Made in Five Sizes—No. 1, for Bar Tops and
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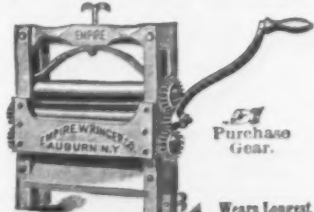
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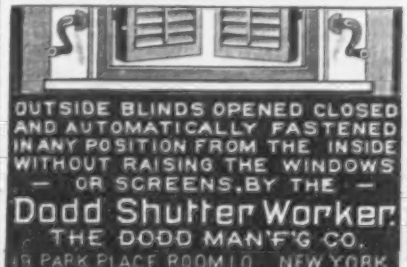
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Acting Force Pump,
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Never Fails. Always Ready.
A Household Necessity. Has
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"COMET" LAWN FORCE PUMP.
Pat. June 23, 1883.
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CANTON, OHIO,
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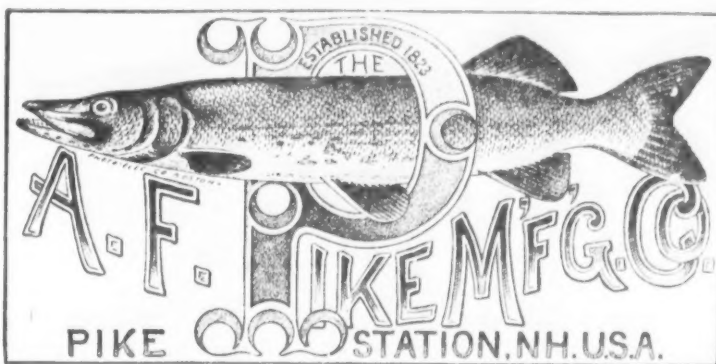
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Wear Longest
Tub Wringers, Bench Wringers, Clothes
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OUTSIDE BLINDS OPENED CLOSED
AND AUTOMATICALLY FASTENED
IN ANY POSITION FROM THE INSIDE
WITHOUT RAISING THE WINDOWS
OR SCREENS BY THE
Dodd Shutter Worker.
THE DODD MAN'G CO.
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Our Cheap, \$1.50 per gross Scythe Stone are

"LEADER" RED ENDS,

Warranted to be the Best and Cheapest Imitation Red Ends in the
Market. They are frauds like all other imitations and not to be
compared to the

Genuine Indian Pond Red Ends,

which are pronounced by all good judges, the world over, the best
Scythe Stone in the world to give a coarse, sharp edge quickly.

Our father established the reputation of
the Red End Brand by painting the end of
the Extra and No. 1 "red," but within a few
years very poor, mean stone have had the
ends painted red, and have been sold for Red
Ends.

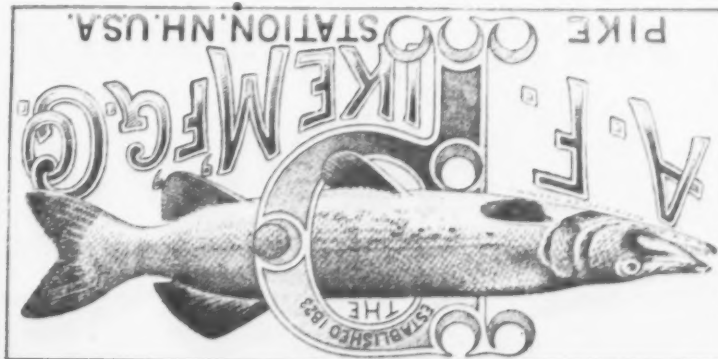
To Get the Best, Buy Only

PIKE'S GENUINE INDIAN POND, RED END, EXTRA
AND NO. 1.

There is no satisfaction or profit for any
one in handling cheap, worthless Scythe
Stones, while there is profit and satisfaction to
every one in good, reliable brands, such as the
following:

- PIKE'S Indian Pond No. 1 and Extra,
" Lamoille and Black Diamond,
" Genuine 9 and 10 inch Ragg,
" Diamond and Gritty Pearl,
" Magic and Willoughby Lake,
" Quinebog and White Mountain,
" "Dodge Chocolate."

The above are No. 1 selected stones from
different quarries, strong, keen, sharp grits,
that will cut away the steel quickly, and can
be used without water and not glaze. Re-
member, we have plenty of cheap Scythe
Stones of all kinds if wanted; also, that we are
headquarters for Oil and Water Stones, Razor
Hones, &c., having seven mills and 2000
acres of quarry lands.



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POST'S "ZERO" METAL,

Registered in U. S.,

FOR JOURNAL BEARINGS.

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THE EDISON MACHINE WORKS,

CABLE ADDRESS: 86 to 108 Goerck Street,

"Xydsun, New York."

Messrs. E. L. Post & Co., No. 10 Peck Slip, N. Y.

Gentlemen:—At a test made under our supervision with a machine designed for testing the friction of different metals, the accuracy of which cannot be doubted, we beg to inform you that the average friction of metals tested was 120 per cent, more than the Post's Zero Metal.

Very respectfully yours, etc.,

W. M. McDUGALL, Supt.

MORGAN IRON WORKS,

JOHN ROACH & SON, Proprietors, Foot Ninth Street, East River.

NEW YORK, Nov. 17th, 1886.

Messrs. E. L. Post & Co., No. 10 Peck Slip, N. Y.

Gentlemen:—Having been interested in the progress of the comparative test of Babbitt and Non-Friction Metals lately made at the Edison Machine Works, would say that they were accurate and results obtained correct. Although our own best Babbitt and Baker's White Brass submitted by us for test were badly beaten, the information gained reverses to our advantage in so far as we now recognize that, by the aid of the metal-testing machine, it has opened the way to procure the "Post's Zero Metal," which we do know to be A No. 1.

Very respectfully yours,

HENRY LEVRAT, Supt.

Result of Comparative Tests POST'S ZERO METAL, with other Babbitt and Non-Friction Metals under Supervision of Edison Machine Works, Goerck St., New York, Oct. 25, 1886:

	Carried Weight Per Square Inch	Revolution of Shaft Per Minute	Temperature of Grease	Average Temperature	Percentage of Friction over Post's Zero Metal	
Post's Zero Metal . .	90 lbs.	740	50	109	—	The result of these tests show an average of 120% more friction than Post's Zero Metal.
Edison Machine Works Best Babbitt . . .	90 "	740	50	147	64	
Hart Metal	90 "	740	72	139	81	
Taylor's Arctic Metal .	90 "	740	66	160	118	
Thos. Wildes Genuine Babbitt	90 "	740	66	141	74	
J. Roach & Son Best Babbitt	60 "	740	66	205	223	
Baker's White Brass . .	60 "	740	66	141	74	
Illinois Smelting Co. .	45 "	740	59	163	108	
Diamond Metal	45 "	740	59	217	216	

Webster, Camp & Lane Machine Co.,

NORTH MAIN STREET,

Near Academy of Music,

AKRON, OHIO, Jan. 12, 1887.

Messrs. E. L. Post & Co.,

NEW YORK.

Gentlemen:—With pleasure we submit the following comparative tests made by us this day of anti-friction metals. The high record in your favor stamps "Zero Metal" as the most profitable for manufacturers and consumers.

J. W. CHAMBERLAIN, Supt.

	Carried Weight Per Square Inch	Revolution of Shaft Per Minute	Temperature of Grease	Average Temperature	Percentage of Friction over Post's Zero Metal	Remarks
Post's Zero Metal . .	123 lbs	1050	70	117	—	The result of these tests show an average of 79% more friction than Post's Zero Metal.
Hoyt's Genuine Babbitt	123 "	1050	70	130	28%	
Post's Zero Metal . .	90 "	1050	70	109	—	
Paul Reeve's Special	90 "	1050	70	130	54%	
Hoyt's "Extra"	90 "	1050	70	182	187%	
Phosphor Babbitt, . .	90 "	1050	70	122	30%	
Hoyt's No. "4"	90 "	1050	70	150	105%	
Bostwick's Polar Metal	90 "	1050	70	121	31%	
Composition Brass . .	45 "	1050	70	116	118%	

Westinghouse Machine Co.,

PITTSBURGH, PA.

U. S. A.

Messrs. E. L. Post & Co.,
NEW YORK.

January 31, 1887.

Gentlemen:—We have this day tested your Post's Zero Metal, in comparison with the following metals, for friction, with results as per table annexed. The small amount of friction produced by the "Zero Metal" is remarkable. The lubricant used in these tests was No. 2 Lard Oil.

Very truly yours,

THE WESTINGHOUSE MACHINE CO.,

Per W. A. BOLE, Supt.

	Carried Weight Per Square Inch	Revolution of Shaft Per Minute	Temperature of Grease	Average Temperature	Percentage of Friction over Post's Zero Metal	Remarks
Post's Zero Metal . .	96 lbs.	1000	78	139	—	The result of these tests show an average of 70% more friction than Post's Zero Metal.
Philadelphia Smelting Co. Genuine Babbitt	96 "	1000	78	177	62%	
Mansfield's A-1, of Pittsburgh	96 "	1000	78	171	52%	
Crane Bro's Genuine, of Chicago	96 "	1000	78	198	97%	

Agents wanted
in Cities not already
represented.

Correspondence
solicited
from dealers in
Manufacturers'
supplies.

Price, 25 Cents Per Pound. Put up in 5 lb. bars—100 lb. Boxes.

E. L. POST & CO., Sole Manufacturers,

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MONTGOMERY IRON WORKS, Ala.
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WATERS & GARLAND, Louisville, Ky.
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GRAY IRON AND BRASS CASTINGS.

To those who are in the market for Castings:

We should be pleased to have you send us drawings, cuts or sketches, or preferably samples of the castings you are using and allow us to quote you our prices. It would be still better to forward patterns with a small trial order on which we will agree to make a satisfactory price. We are confident of our ability to produce castings of the finest quality known to the trade at reasonable prices. We use only the best obtainable materials and approved modern appliances. We employ only steady and intelligent skilled workmen, paying them good wages. While this may make our castings cost more per pound than those of cheap material and poor workmanship, we will guarantee ours to be much less expensive to the user in the end, because of their proper weight and the time and labor saved in the drilling, planing, turning, filing or other finishing. We prefer the reputation of being a high-priced house which does only the very best work to the name of a cheap producer of rough, hard and low-priced castings, out of shape or of heavier weight than the patterns call for. It is astonishing to notice how



much extra weight can be (and often is) added to a casting by a careless, incompetent molder, rushing out piece work at starvation wages! This is generally overlooked by buyers of cheap (!) castings.

We have lately had the unsolicited testimony from a customer in London, to whom we had shipped some light iron castings, that his workmen were able to finish our castings in one-third the time they required to do the same work on castings from similar patterns made in England!

We have facilities for wood and metal pattern making, drilling, polishing, plating, japanning and the manufacture of hardware and light machines by contract.

Machinery Castings, Light or Heavy.

Low Prices on Large Contracts.

Freight paid to principal points in New England and New York.

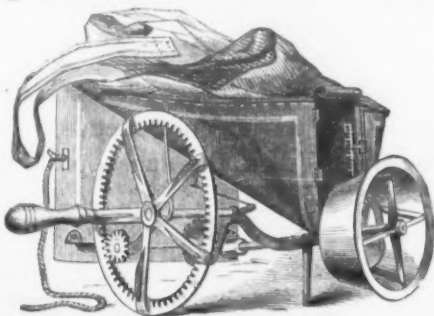
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SPRINGFIELD FOUNDRY CO., 93 Liberty Street, - SPRINGFIELD, MASS.

PEARCE'S IMPROVED CAHOON BROADCAST SEED SOWER,

For Sowing all kinds of Grain and Grass Seed.

Sows from 4 to 8 acres per hour at a common walking gait, throwing out wheat about 40 feet wide. Does five times as much work as can be done by hand, and better work than



can be done by any other means whatever, and at a saving of $\frac{1}{3}$ the seed over hand sowing. Any one can operate them, and they can't get out of order.

Simple, Durable, Cheap and Effective. Pay for themselves in One Day.

GOODELL & CO., Antrim, N. H., Sole Manufacturers.

WRITE FOR CIRCULAR AND PRICES.

KING'S GREAT WESTERN POWDER CO., CINCINNATI, OHIO.



Manufacturers of the Celebrated KING'S 'QUICK SHOT'

The Strongest, Cleanest and Quickest Trap and Wing Powder Made.

'ROYAL' RIFLE POWDER

Always Strong, Clean and Reliable.

Mining and Blasting Powders.

Send for the third edition of Handy Book for Trap Shooters and Sportsmen. SENT FREE.

Springfield Glue and Emery Wheel Co.,

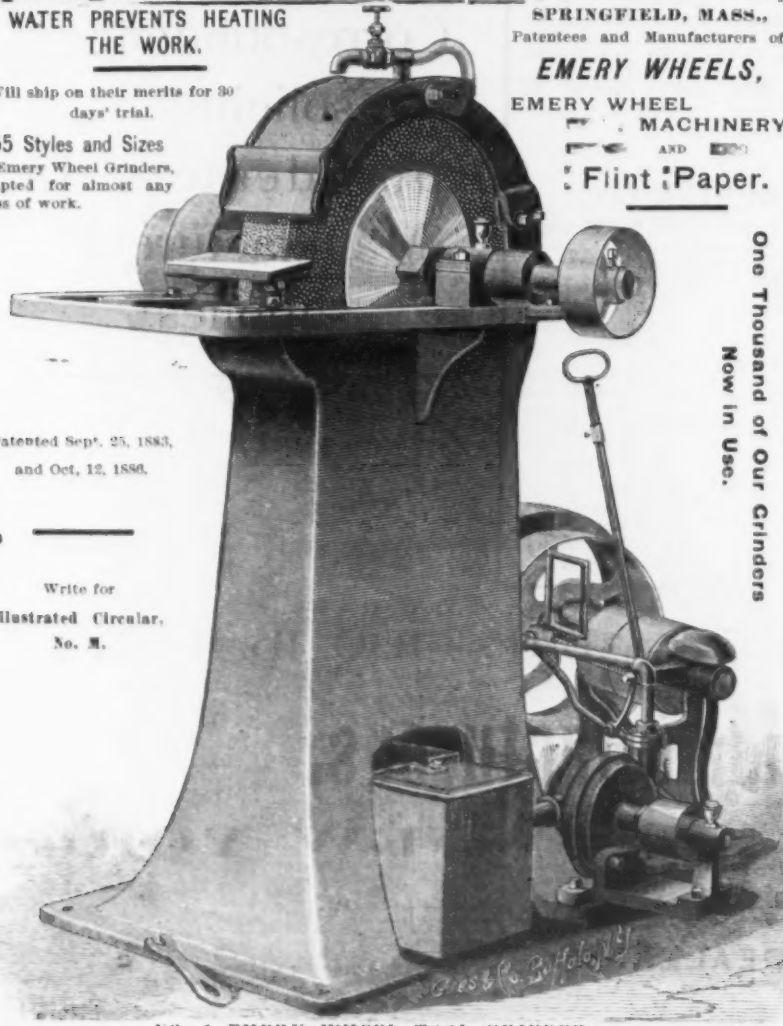
WATER PREVENTS HEATING THE WORK.

Will ship on their merits for 30 days' trial.

55 Styles and Sizes of Emery Wheel Grinders, adapted for almost any class of work.

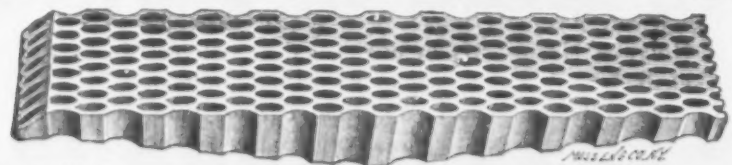
Patented Sept. 25, 1883, and Oct. 12, 1886.

Write for Illustrated Circular, No. 1.



NO. 1 EMERY WHEEL TOOL GRINDER.

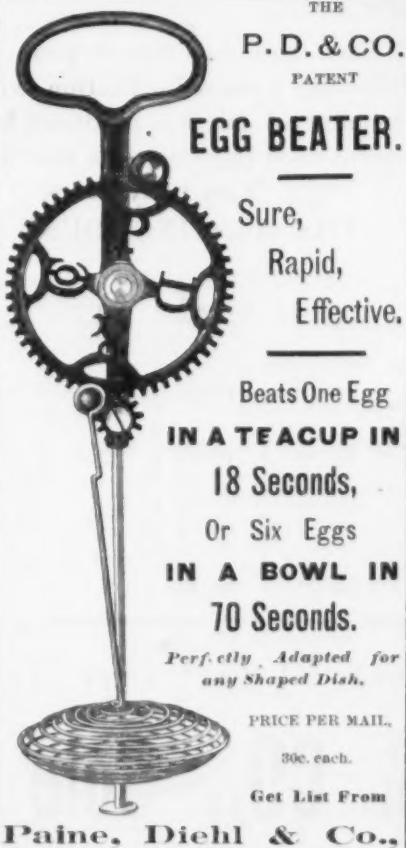
HOOPER'S 70% GRATE BAR.



Will not warp. Will not burn off at the ends. Send for Circular and Price List to

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Will give absolutely 70% air space. Will give uniform combustion of fuel. EAST FERRY STREET IRON WORKS, NEWARK, N. J.



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Sure, Rapid, Effective.

Beats One Egg IN A TEACUP IN 18 Seconds, Or Six Eggs IN A BOWL IN 70 Seconds.

Perfectly Adapted for any Shaped Dish.

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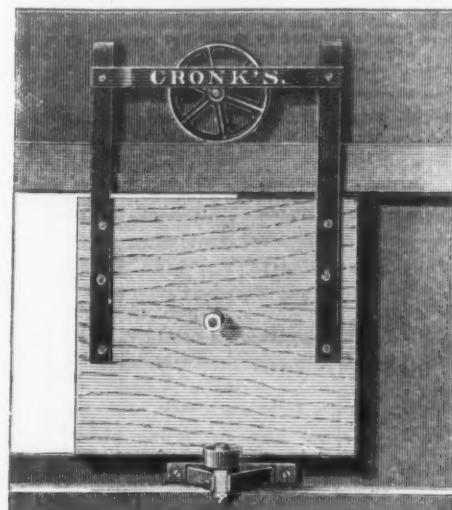
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EXHAUST & TUMBLING BARRELS (Illustrated Catalogue sent on application.)

WROUGHT IRON. ANTI-FRICTION.



IT EXCELS ALL OTHERS

In security of door. In ease of motion. In simplicity of application.

This Hanger and Iron-Clad Track costs less than others that are not as good, and it sells at sight. Requires no oil. Has no flange wheels. Cannot break or get off the track.

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LANE'S PATENT STEEL DOOR HANGER.

The most perfect Anti-Friction Hanger in the Market.



BECAUSE

It is made of steel throughout, except the wheel which has a steel axle. It will not break. It is practically free from wear. It is almost noiseless in action. It requires no oil. It has a broad bearing on the door, and keeps in line. It is by far the most durable. It may be used with any track. It is always in order.

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Is made of steel and is easily put in position. Catches and holds no snow or ice. Door hung thereon cannot jump the track. Is not subject to decay. Requires no fitting, but is ready at once. May be used with hangers of other manufacture.

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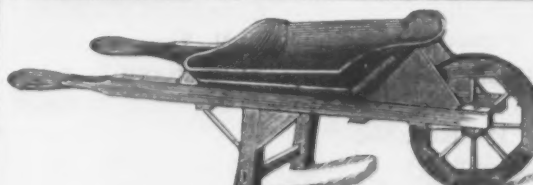
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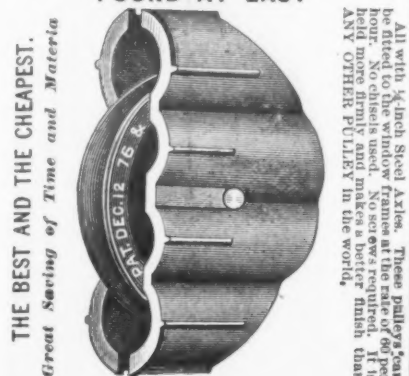
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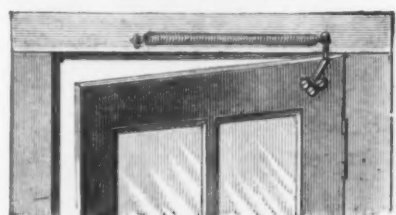
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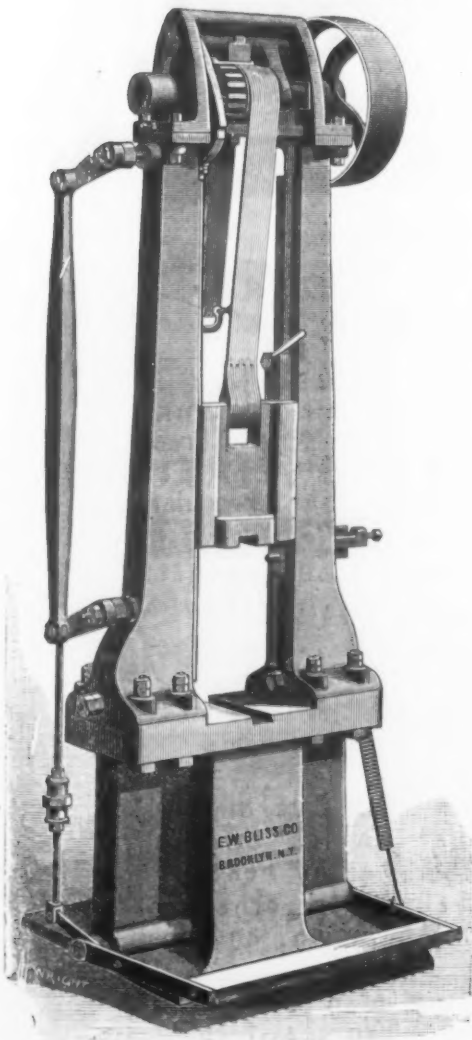
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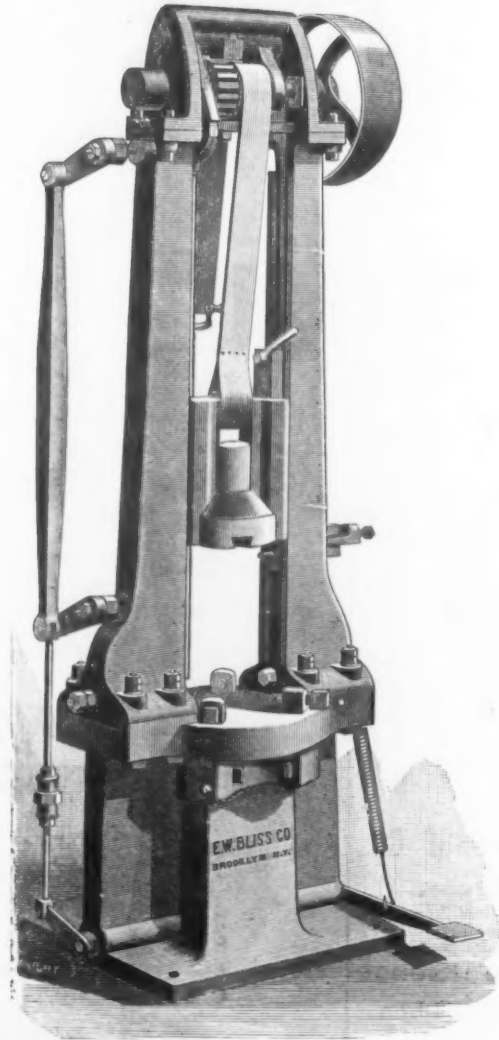
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SAFETY,
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GENUINE.

THE COVERT "NEW" SNAP.

*It is a "BIG
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Patented March 16, 1875, and April 22 1884.

*and we guarantee
it to give satisfac-
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It is a well-established fact that the COVERT SNAP has been the leading Snap in the market for the past twelve years, and has brought the best prices. To-day the

"NEW" COVERT SNAP

is superseding all others, and will be the leading Snap in the market for many years to come, as a large number of flattering testimonials we have received from the trade attest. In form and appearance it is superior to any Snap made, and in quality and durability it fully equals the Old Covert Snap. The majority of leading jobbers are now heavy buyers of the "NEW" COVERT PATENT SNAP, finding in their superior quality and extreme low price, a most satisfactory inducement.

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Sold by all Leading Jobbers Handling this Class of Goods.

WEST TROY, N. Y.

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CLOTHES WRINGERS,

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ERIE RAT TRAP,
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GENTLEMEN:

We ask your special attention to our new line of Clothes Wringers. An experience of over thirteen years in the manufacture and sale of this class of goods, we believe, enables us to judge correctly of the wants of the trade and the public.

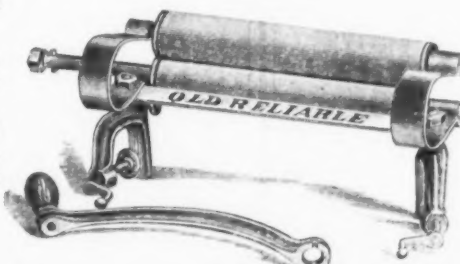
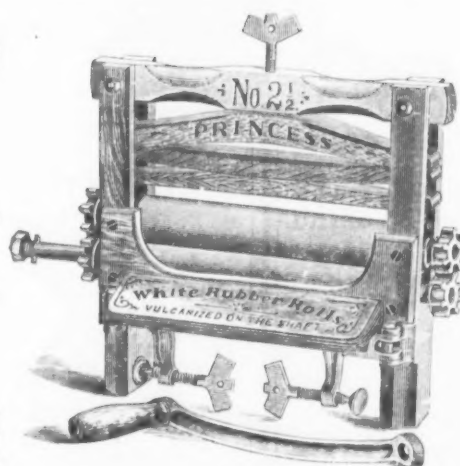
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Our facilities for the production of these goods are unexcelled; we have a new factory, the latest and most improved machinery, the best of skilled workmen, and are fully able to meet any demand that may be made upon us, either for quantity or quality.

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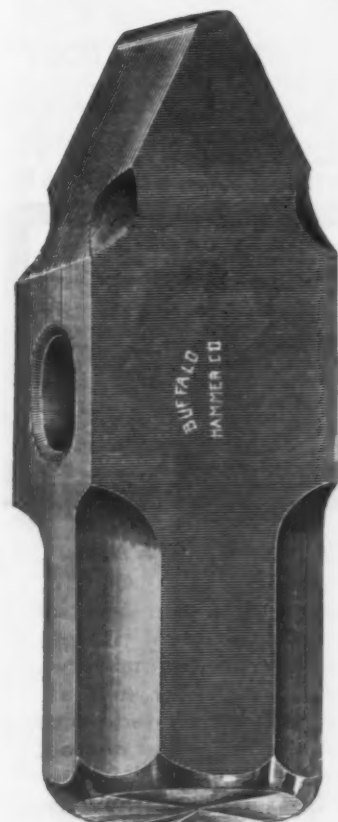
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MANUFACTURERS OF SOLID CAST-STEEL

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Blacksmith's Sledge.
Cross Pein.



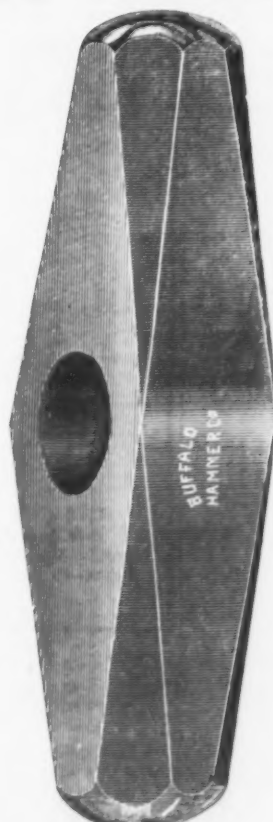
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CHEAP, DURABLE, EFFECTIVE.

CAN BE APPLIED IN 5 OR 10 MINUTES.

It gives a positive force to the machinery, and increases the power of the belt more than 60 per cent.

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Inventors and Sole Manufacturers,
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Send for Circular and Sample. Mention this Paper.

"THE DETECTIVE Burglar Alarm."
Patented in this and other Countries

May be applied to any door or window in a few seconds. When the door is opened or the window raised the Alarm falls to the floor, exploding a No. 32 blank cartridge.

Is packed complete with four cartridges, weight 6 ounces. Endorsed by Hon. Wm. B. Smith, Mayor of Philadelphia, and Gen. James A. Stewart, Chief of Police.

Having improved the Alarm and are now manufacturing them in large quantities, we are prepared to quote lower prices than heretofore—viz., \$1.50 per dozen, or \$18.00 per gross; no charge for boxing or cartage.

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120 Gross sold in the past year.

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We manufacture Open and Top Buggies, consisting of the Side Spring, End Spring, Brewster, Timken and Edward Storm Spring.

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More popular than any Powder now in use.

BLASTING POWDER and ELECTRICAL BLASTING APPARATUS. MILITARY POWDER on hand and made to order.

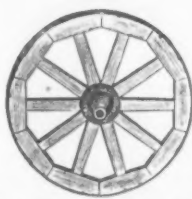
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Manufactured only by the
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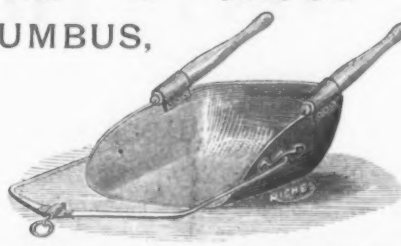
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ORIGINAL
Of this style of implement,
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THE KILBOURNE & JACOB MFG. COMPANY,
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"Columbus" Solid Steel Scrapers.



Jacobs' Patent Steel Spoke Wheel.

Is pressed from one solid sheet of heavy steel, and is the strongest and most durable Road Scraper made. We make three sizes of these Scrapers. No. 1, Capacity, 7 cubic feet of earth. No. 2, 5 cubic feet of earth. No. 3, 3 1/2 cubic feet of earth. Furnished with or without solid steel shoes or runners, as desired. We also furnish these Scrapers with end gates when so desired. The balls are of refined iron, with strong and perfect working swivels. Bows nest and handles crate compactly for shipment.



RAILROAD OR CANAL BARROW.

With Jacobs' Patent Wood Wheel. Bent Tray, full sized, planed and well finished.



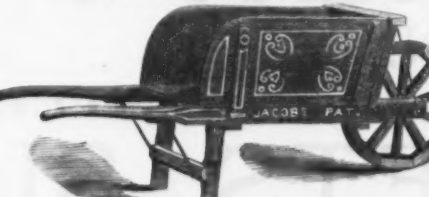
RAILROAD OR CANAL BARROW.

Same as above, except with Jacobs' Patent Steel Spoke Wheel.



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With Jacobs' Patent Wood Wheel. All hardwood. Bowl dovetailed together and firmly nailed.



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Double Frames and so constructed that by simply removing one bolt (the axle) and two nuts they can be folded flat down (see cut) and shipped at lowest rate of freight. Three sizes.



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Wrought Steel
Sinks.



"COLUMBUS" Solid Steel Tray Barrows.

No. 1, capacity 3 1/2 cu. ft., Jacobs' Patent Steel Spoke Wheel.

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With Jacobs' Patent Wood Wheel. Folds for shipping, same as Garden or Farm Barrow.



STRAIGHT HANDLE STONE BARROW.

With Jacobs' Patent Wheel. Strong, well-made, iron strapped over bottom and bolted together. For a one or pig iron, &c.



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With Jacobs' Patent Wheel. 17 1/2 inch tire. Well ironed and bolted. Extra strong.



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Bottom and Dash formed of one plate of Steel one-fourth of an inch thick. Steel Spoke Wheel. The strongest and best Stone Barrow manufactured. Very durable.



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The Bow or Box is made of the Best Steel Plate, 3-16ths of an inch thick. The Tongue Braces or Bail Lever and Hangers are all of Steel. Barren patent wheels. These Scrapers have no wood parts to rot or castings to break, no ratchets to clog up, and fewer nuts to come off and parts to get out of order than any other Wheel Scraper. They are so constructed that the team does most of the lifting, and One Man can fill, raise and dump the largest size with ease. They are so hung that there is absolutely NO STRAIN WHATEVER ON THE HORSES' NECKS.

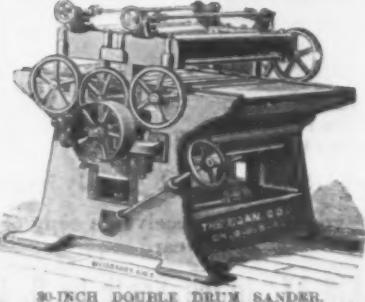
No. 2, Capacity 12 cubic feet. No. 3, Capacity 16 cubic feet.

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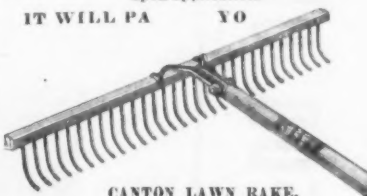
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Tacks in an original form.
Something new and attractive
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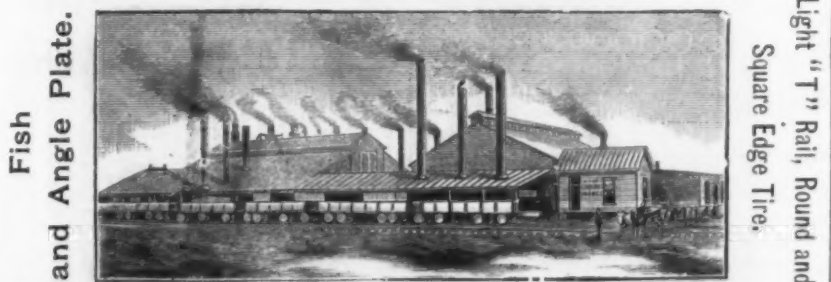
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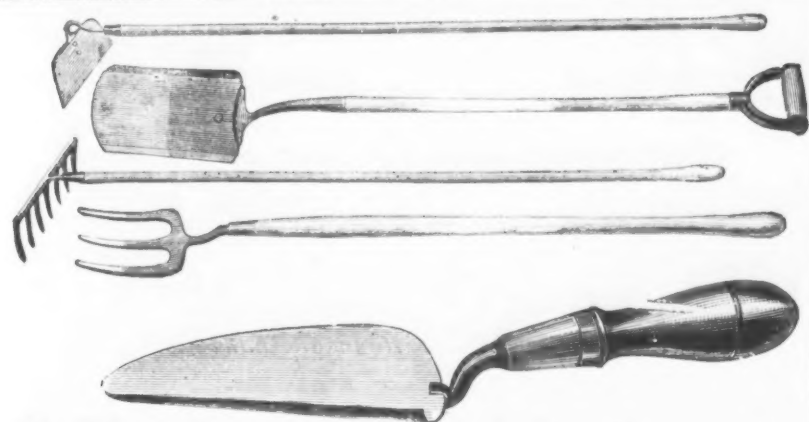
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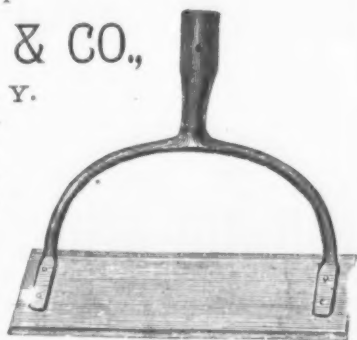
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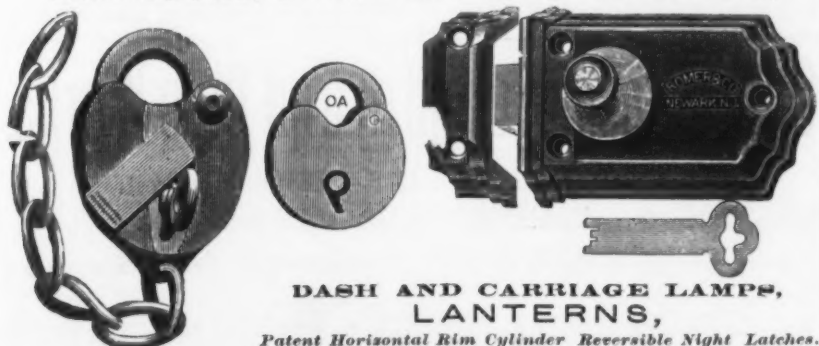
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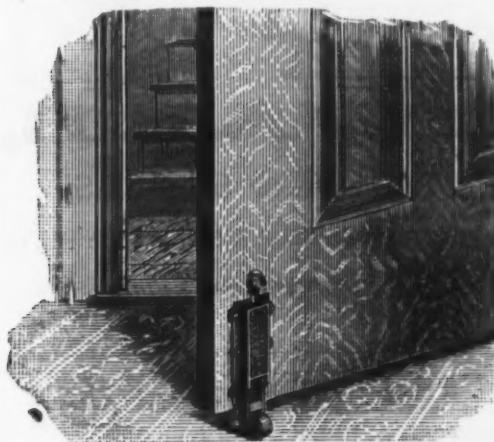


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DOOR HOLDER

Coultaus' Patent.

PATENTED NOVEMBER 6, 1883.

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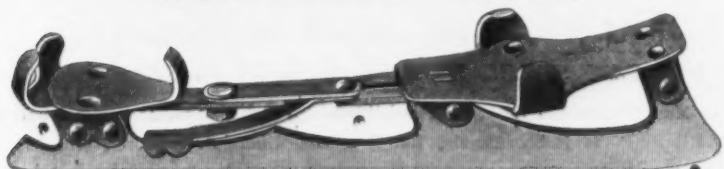
The door is held in any desired position by the pressure of the roller on the floor, making it a most useful article for dwelling houses, offices, stores, hotels, railroad cars, hospitals, &c., and doing away with the hooks, chains, wedges, bricks, &c., ordinarily used for this purpose. The rubber covering to the roller does no injury to carpets or oil cloths, and by simply lifting the handle the spring can be thrown out of use when desired. If the holders are required to operate against very strong springs or winds, it should be so stated when ordering.

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THESE TWO CUTS REPRESENT EXTREME SIZES OF
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This tool is designed to meet the needs of CARRIAGE and CABINET MAKERS. It is also specially adapted to REPAIR WORK, and is THE BEST FARMERS' BIT in the market.

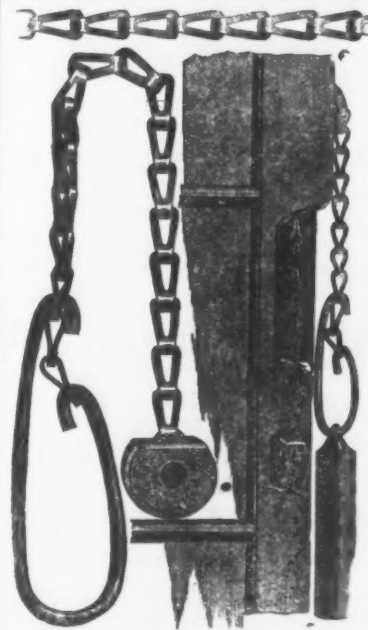
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Centennial Award. "Superior in Every Respect." This is one of the best selling locks in the market, and affords the dealer a large profit. It is thoroughly and strongly made—of the best material—very handsome in appearance, and every Lock is warranted. Orders solicited.

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is a substitute for cord in hanging weights to windows. It is manufactured by us only, and by automatic machinery, patented and owned exclusively by ourselves, and whereby we secure uniformity of construction and quality. We have been to great expense in producing a metal having all the qualities and conditions requisite for making suitable chain for this purpose, and to prevent other chain of the same pattern of link and of the same general appearance, but made from an inferior metal, being offered as the same thing, we patented the word "Giant" as a Trade-Mark, as applied to either metal or chain, Trade-Mark Registered April 16, 1878, and October 22, 1878, and our metal is therefore known in the market as "Giant Metal," and our chain as "Giant Metal Sash Chain."



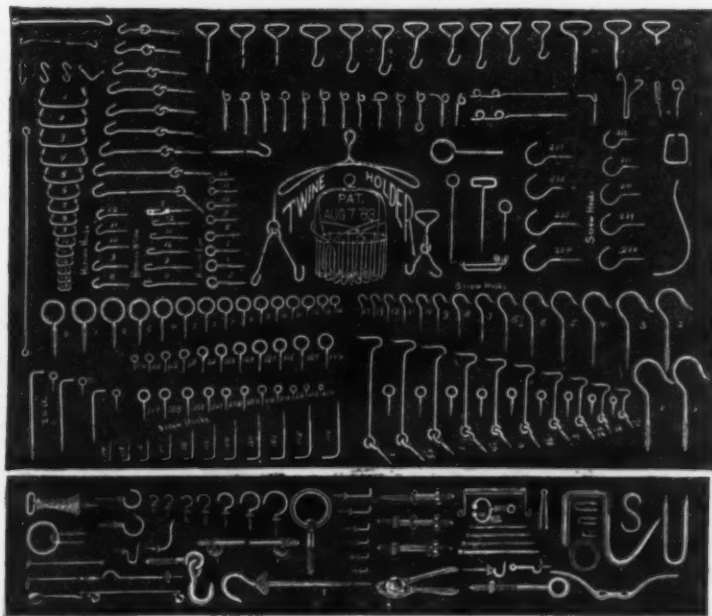
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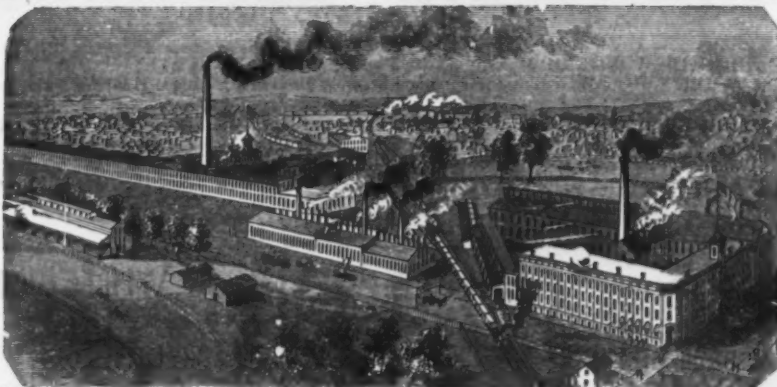
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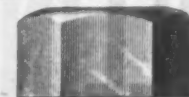
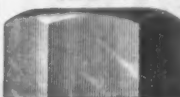


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A SPECIALTY.



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GATE FIRE HYDRANTS,

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Valves and Hydrants made with Babbitt Metal Seats and non-corrosive working parts.

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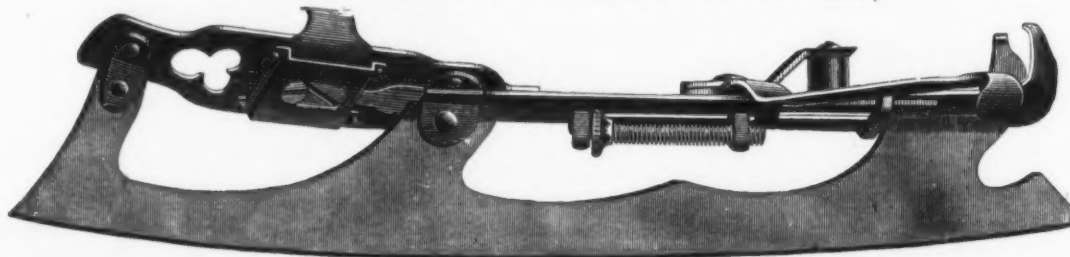
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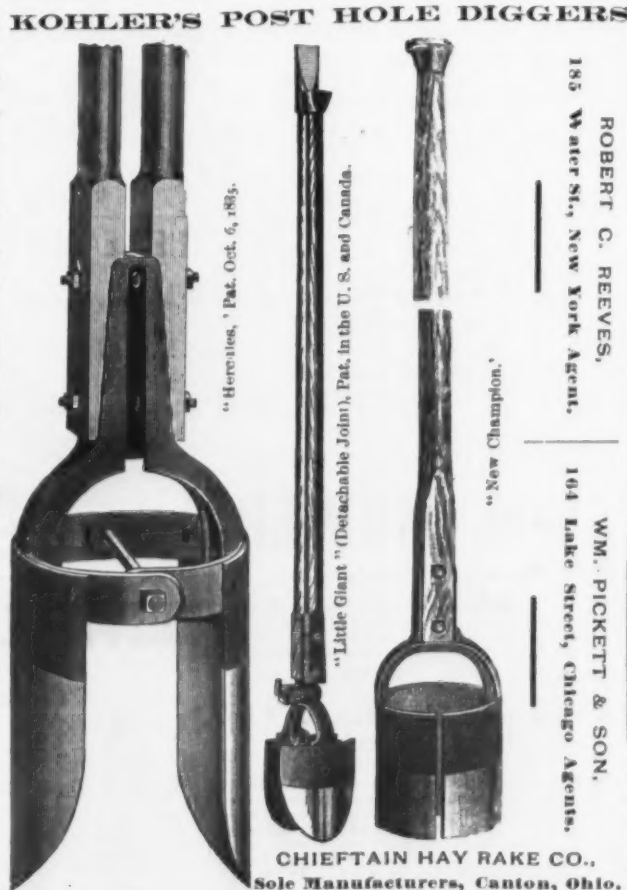
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A very important feature of the IVES' SASH LOCK is its secure locking when closed and simultaneously drawing the setting rails closely together. All the movements are accomplished by cams, without the instrumentality of springs, thus avoiding the possibility of getting out of order.

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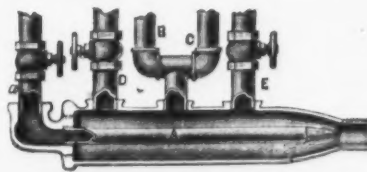
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for protecting polished surfaces of goods made of steel or iron from rust during shipment or storage. Dries instantly and leaves polished surfaces perfectly natural. The article is on its own merits, and if you desire to test it we will cheerfully send a small can free of charge, you to pay express charges. Send for circular.

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Will stop all snapping and cracking noises in steam pipes in rooms heat in. The only fitting in the world that will do it. It is worked by steam or air passing through the heaters.

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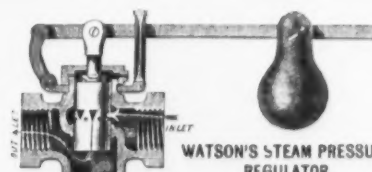


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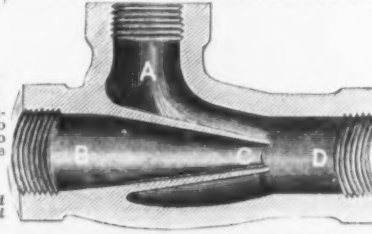
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The trade will soon find an ordinary and roughly-made Reel of blades and stationary knife is not all that is required to make a perfect Lawn Mower.

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Guaranteed
Superior to any
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MOWER
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The Cylinder Knives are solid cast steel, made by a patented process; are hardened and tempered in oil, self sharpening, and never require a file or stone after leaving the factory. All the bearings are long, so that the wear on the Mower will be slow, and oil seldom required. It is made to run at high speed, and will not only cut higher grass, but leaves the lawn perfectly smooth.

Continental Lawn Mower.
1887.

**LIGHTEST RUNNING
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SWIFTEST CUTTING.**

Cutting Bar in the rear adapt-
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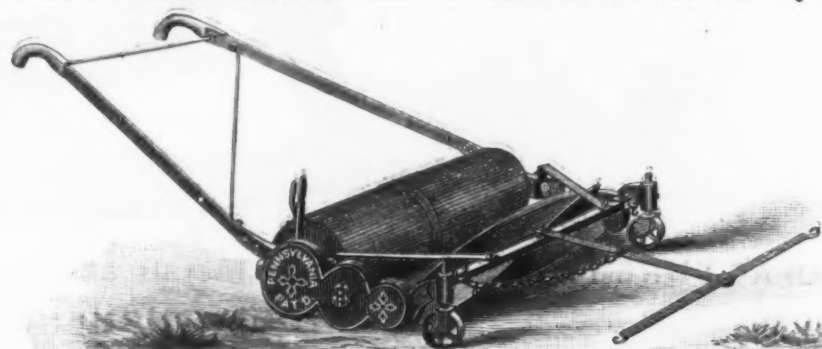
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PENNSYLVANIA HORSE LAWN MOWER.—Open Cylinder.

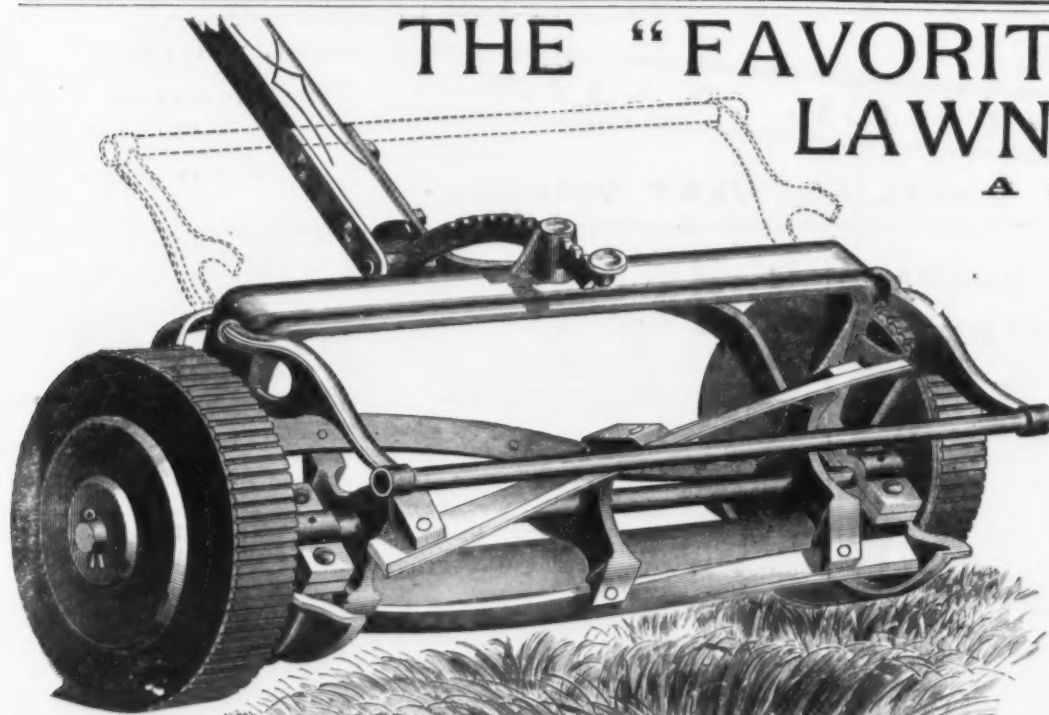
Showing Mower with Seat and Spring, Shafts and Handles. Draft Irons Detached.
Width of cut 30 inches. Weight, 320 lbs.



Horse Mower, Open Cylinder, 30 inch Cut, with Handles and Draft Irons, \$170.00
Extra for Seat, Spring and Foot Board, - \$3.00 | Extra for Shafts, - \$7.00
We recommend the Mower with Draft Irons only. Discount on Horse Mowers is not same as on Hand Mowers.

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Horse Mower, Closed Cylinder, 30 inch Cut, with Handles and Draft Irons. Price, \$100.00
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LAWN MOWER.**

A SPLENDID SUCCESS.

The Favorite is handsomely finished in Black and Gold, producing a very novel and attractive appearance. The Favorite runs with greater ease, and more nearly noiseless than any other Mower on the market. In no other Mower can the height of the cutting knives be so readily adjusted to cut from $\frac{1}{4}$ up to 2 inches, as may be desired, accomplished by means of the segment connecting the handle and the frame. The Favorite is always driven directly from the center; is made with solid frame so that all parts are united together as a single piece; is provided with an adjustable tree guard, which, when desired, can be thrown forward to protect trees or shrubbery from injury, or, when not needed, can be thrown back to lie on the handle. The Favorite will cut grass quicker, closer and easier than any Mower ever introduced to the trade.

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The Lightest Running,
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MALLEABLE AND STEEL.

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It is the **LIGHTEST** and **STRONGEST**. The **STEEL PAWLS** are a combination of Gravity, Friction and Force, requiring no springs. The **CLUTCH** is positive, and therefore has no lost motion. The "HANIKA" can be made a High, Low, Front, Rear and Angle Cut. It is the **CHEAPEST, BEST** and **MOST DURABLE** machine made.

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SOLE MANUFACTURERS OF
THE MORRIS PAT. SASH LOCK,
REVERSIBLE RABBETED MORTISE DOOR LOCK,
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IN ALL KNOWN FINISHES.

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Entirely new methods and de-
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Will outwear any three
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Does the best work with the
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centre ridges.

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The only perfect Lawn Mowing Im-
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Equally adapted to mowing the narrow-
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Leaves no grass to be cut with a sickle.

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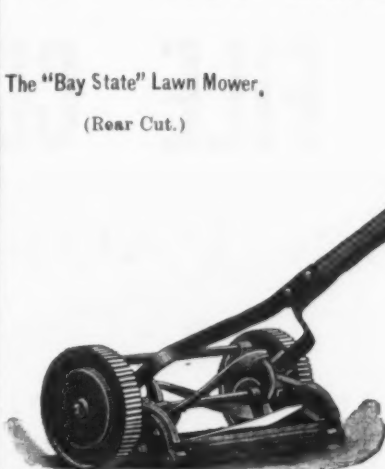
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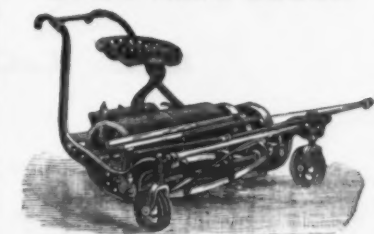
are of the ordinary Side-Wheel pattern. They are con-
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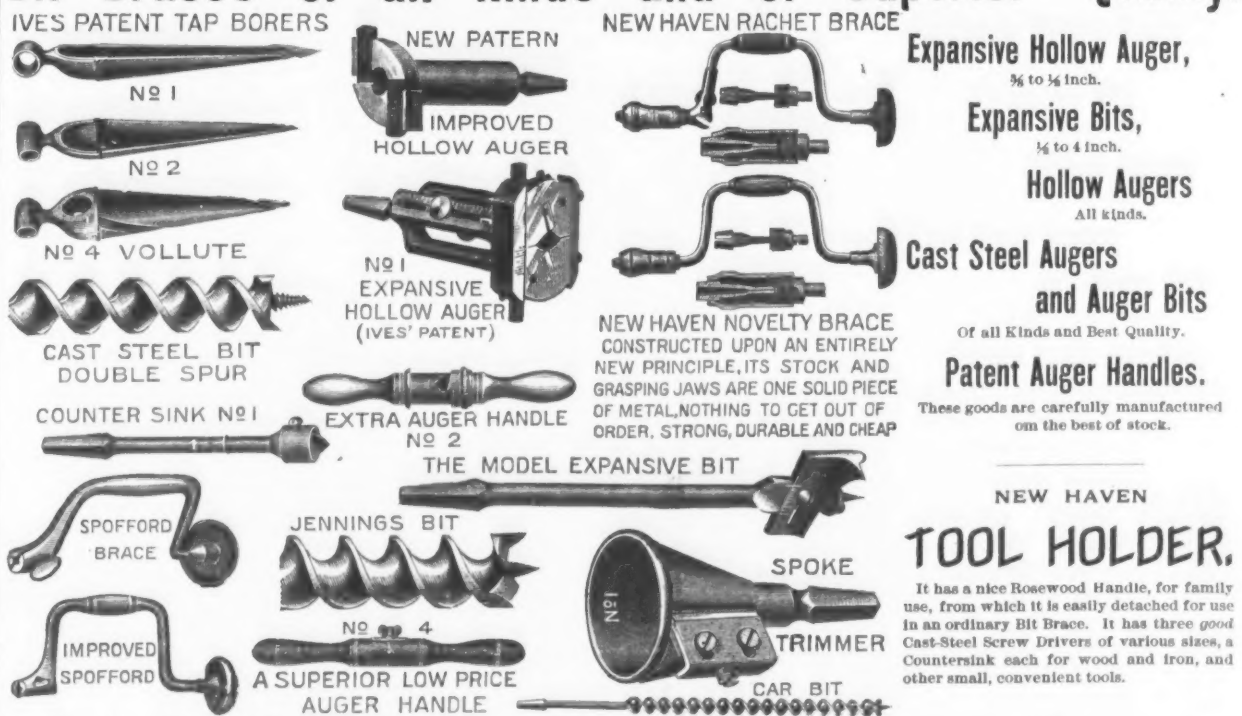
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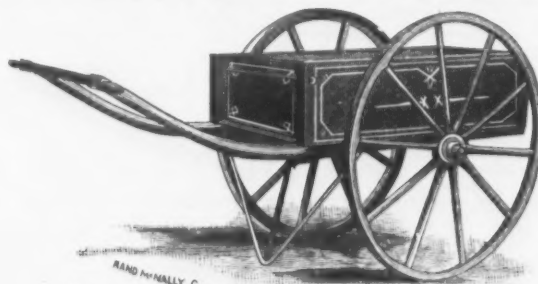
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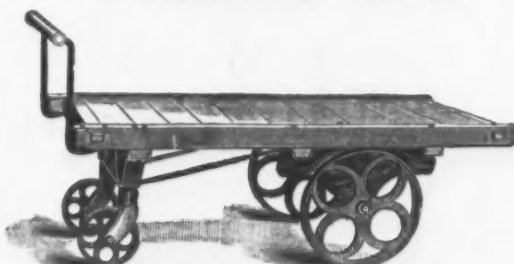
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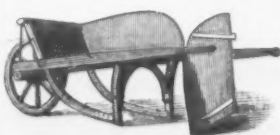


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THE REYNOLDS IMPROVED TRUCK.

Front Wheels Casters. Truck turns in its own length.
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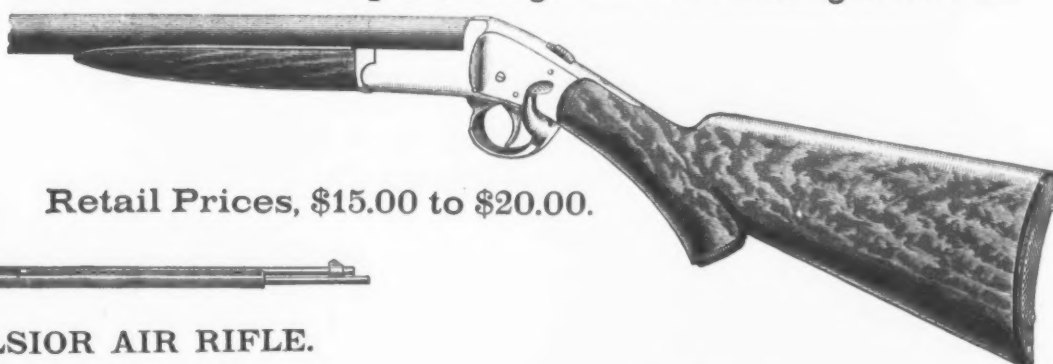


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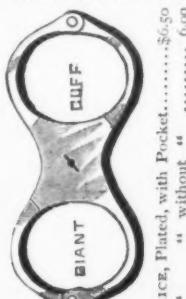
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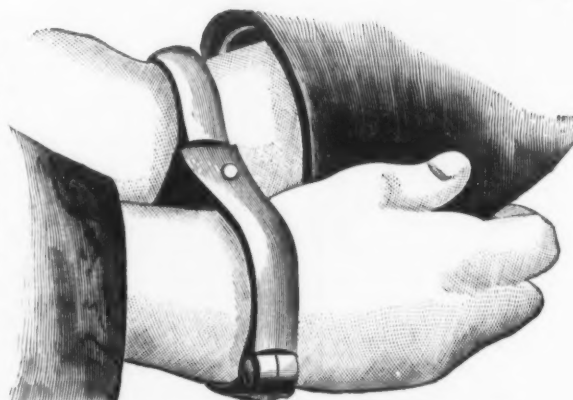


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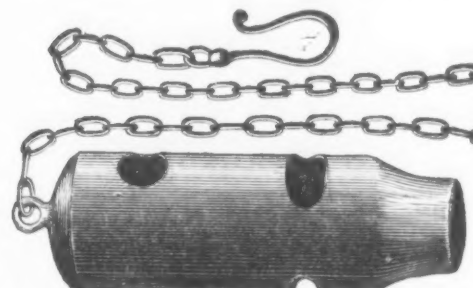
Weight, 10 1/4 ounces.



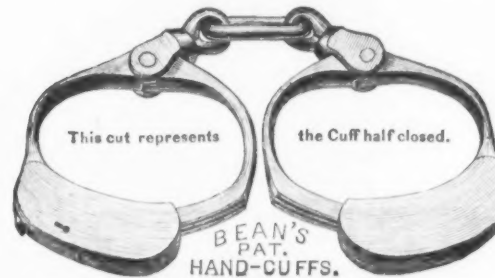
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Impossible for the Prisoner to remove them from his wrist either with or without the key.



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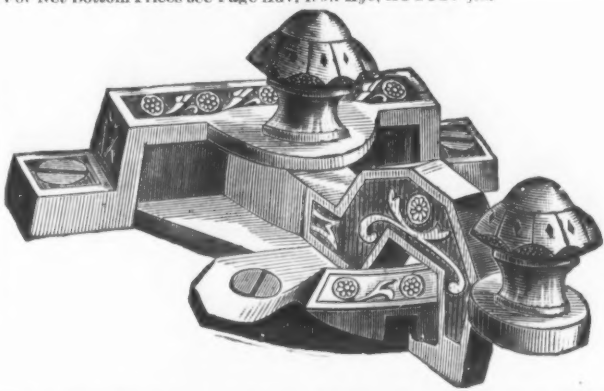
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FOR NET BOTTOM PRICES SEE PAGE AD
IN IRON AGE, AUGUST 5th.



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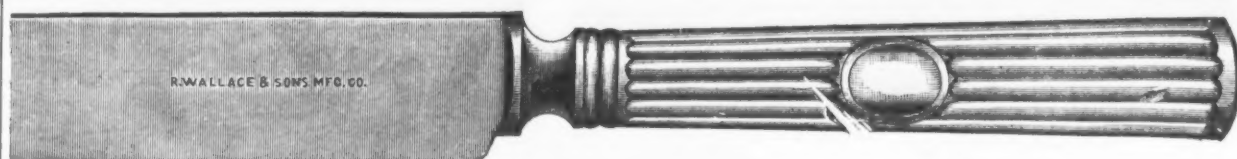
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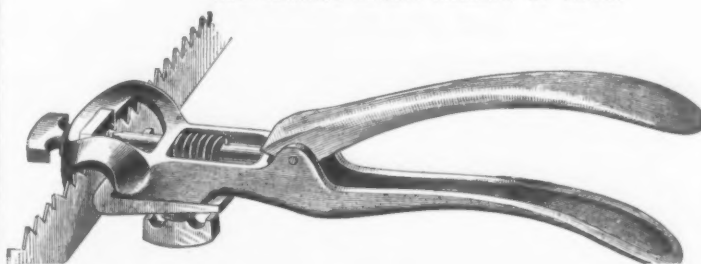


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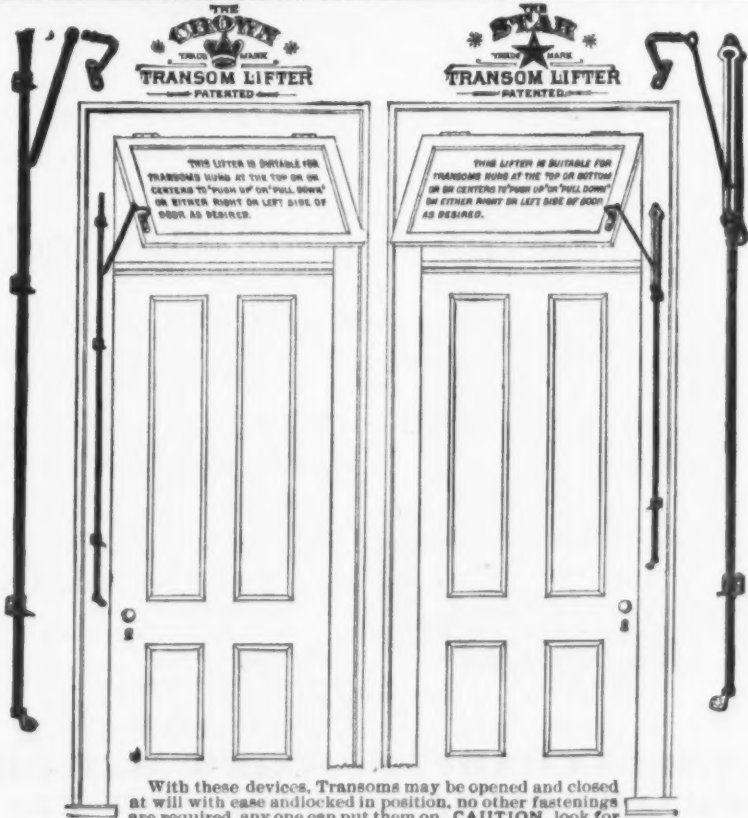
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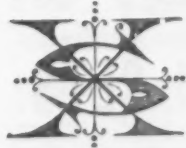
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44	4 "	" "	" " 0.65		84	4 "	" "	" " 0.80			
45	5 "	" "	" " 0.75		85	5 "	" "	" " 0.90			
46 1/2	3 "	" "	Nickel Plated, 1.75		86 1/2	3 "	" "	Nickel Plated, 2.00			
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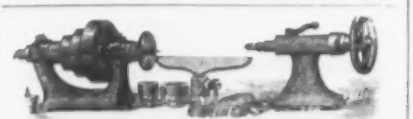
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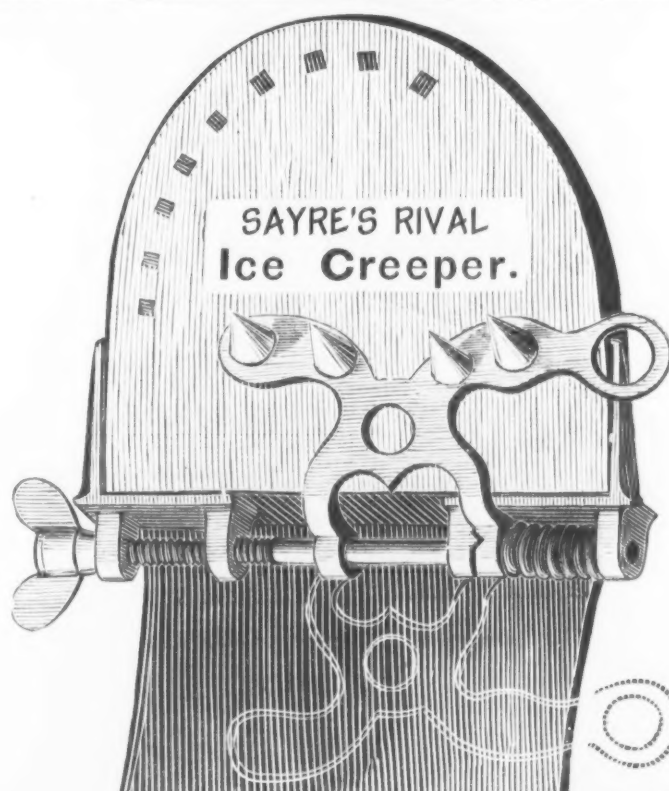
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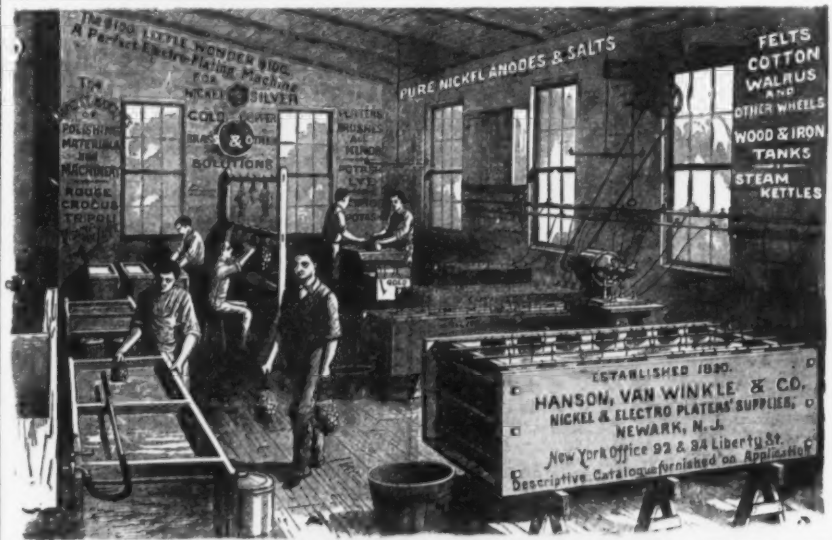
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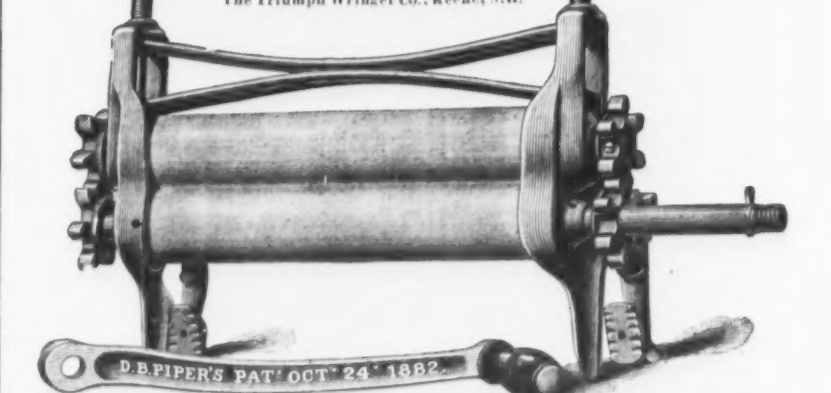
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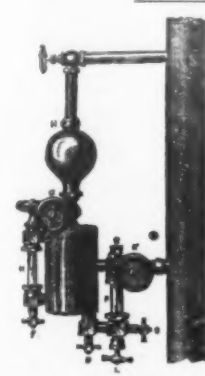

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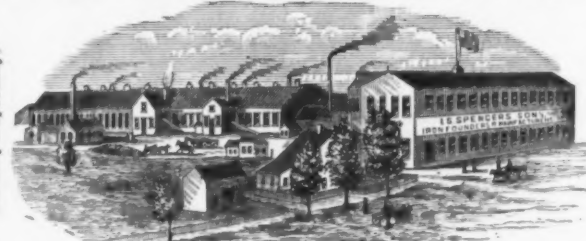
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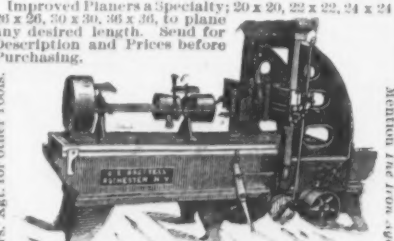

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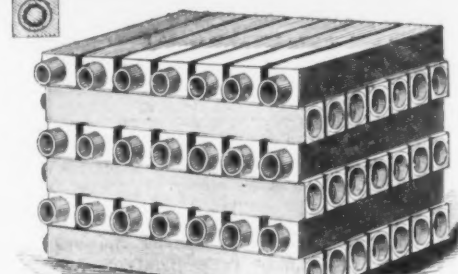




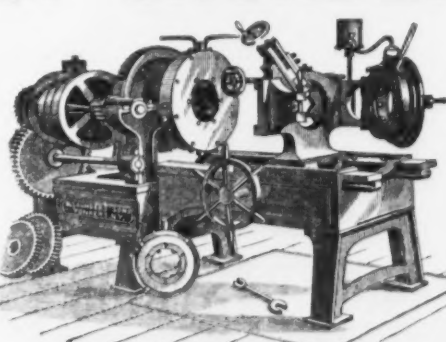




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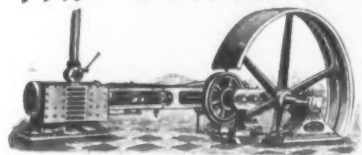
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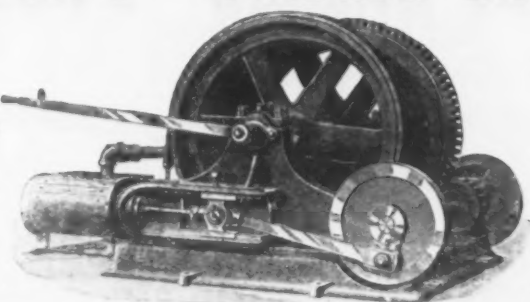
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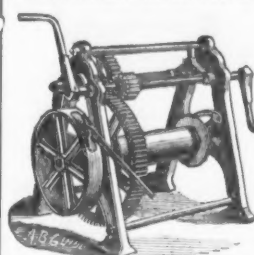
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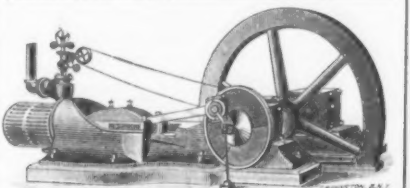
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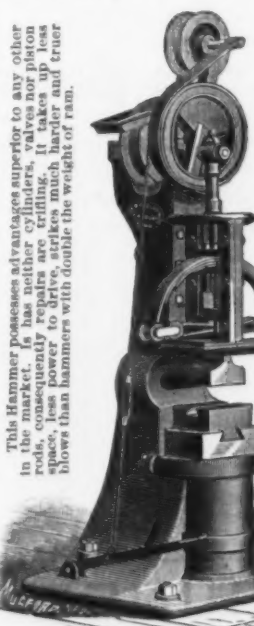
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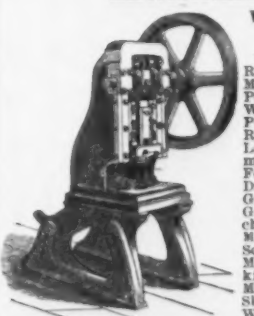
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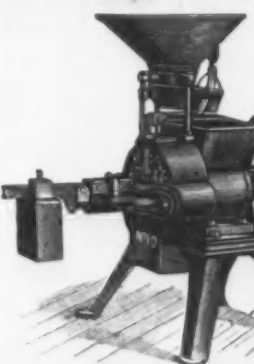
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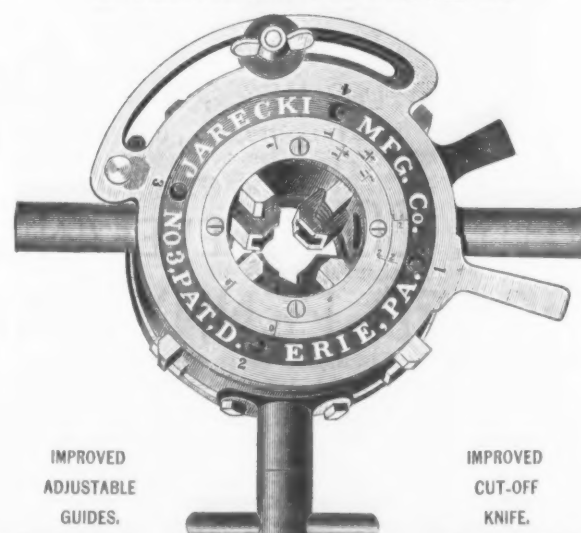
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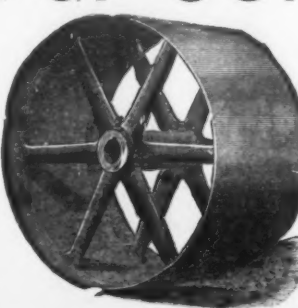
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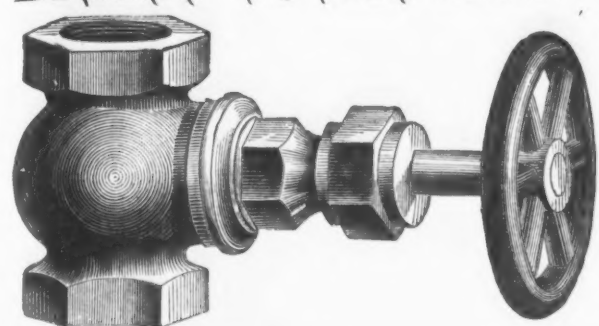
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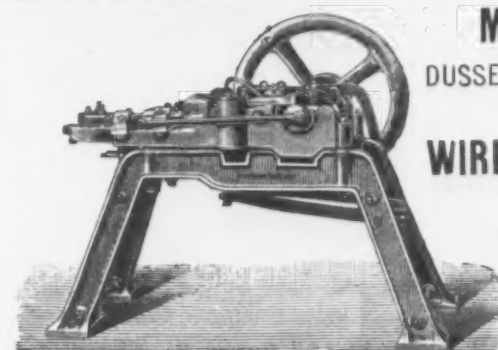
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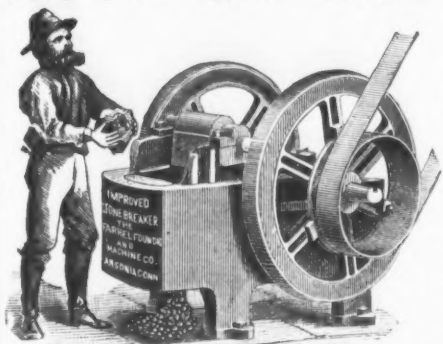
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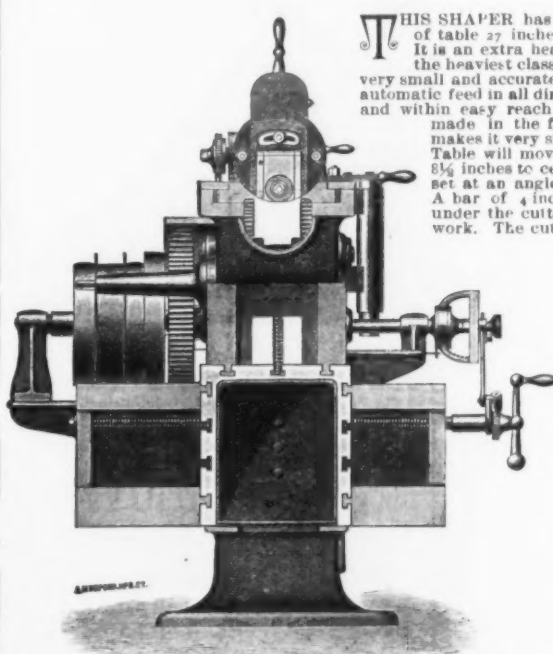
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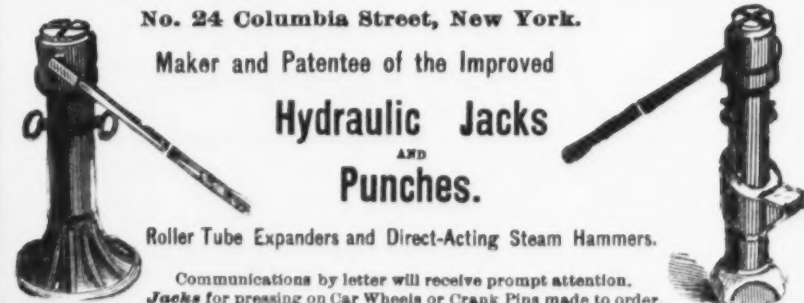
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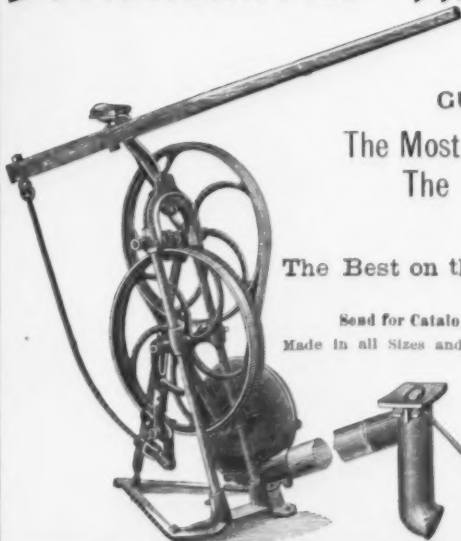
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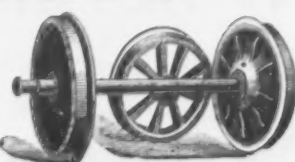
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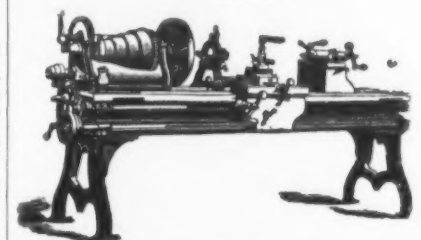
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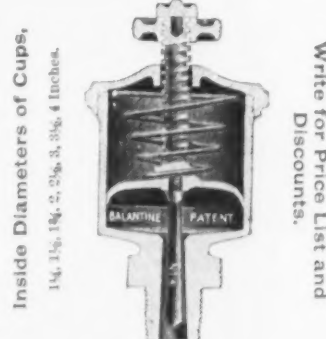
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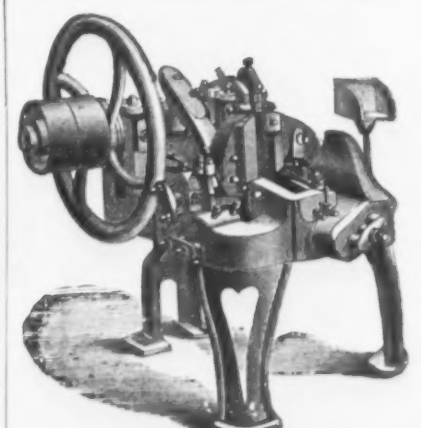
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